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THE

# NATURALIST:

A

MONTHLY JOURNAL OF

## *Natural History for the North of England*

EDITED BY

W. H. PEARSALL, D.Sc., F.L.S., and W. R. GRIST, B.Sc.,
THE UNIVERSITY, LEEDS.

*with the assistance as referees in special departments of*

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# The NATURALIST

## A MONTHLY ILLUSTRATED JOURNAL

PRINCIPALLY FOR THE NORTH OF ENGLAND.

SMITHSONIAN INSTITUTION
JAN 21 1934
NATIONAL MUSEUM

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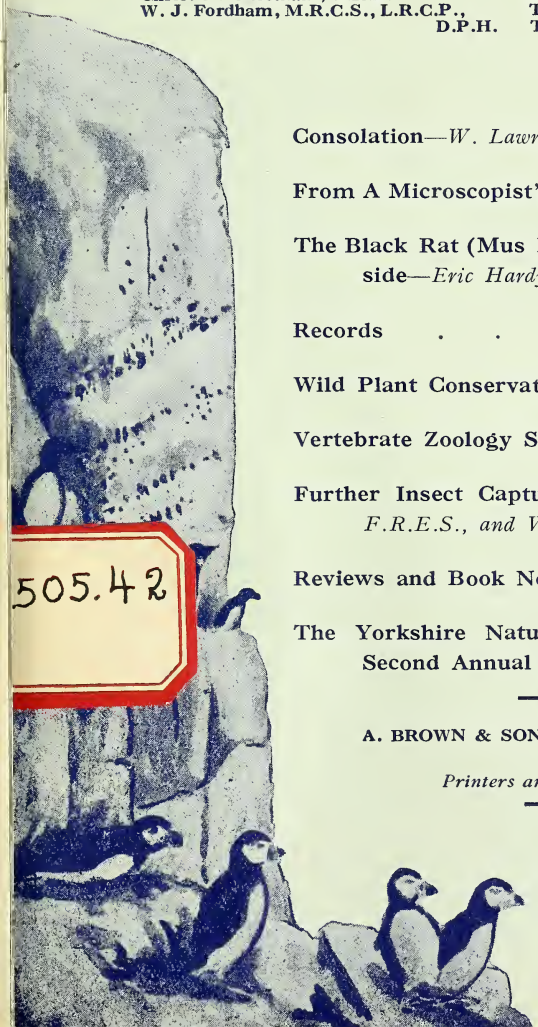

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# THE NATURALIST

FOR 1934.

## CONSOLATION.

W. LAWRENCE SCHROEDER.

BENEATH the ceaseless murmurings of the sea
That breaks, with slender line of foam
Upon the rocks
That shelve in abrupt layers
From the cliff, o'er which
The sea-birds move in lazy sweep,
I hear low subtle melodies—
Breathings of old desire—
That seem to hold the passion
Of the agelong interweaving
Of the restless waves,
And the mingling of the sunlight
With the creeping foam :
Into my tired mind
The music gently steals
With sweet consoling power :
And all the little cares
That seemed so great a burden
Fall away.

## FROM A MICROSCOPIST'S NOTEBOOK.

W. LAWRENCE SCHROEDER.

SOME years ago, in late October, I swept a Shibden Valley pond. Little was obtained from the top layers, but by sweeping about three feet below the surface level I got a very good haul of water fleas and phantom larvae. The weather was moderately cold. A few weeks later, in mid November, I visited the same sheet of water. There was a bitter east wind, and the water was exceedingly cold : my fingers as they dabbled in it felt like sticks of ice. Yet in the top waters there were considerable numbers of cyclops, daphnia, diaptomus and the like ; while from the lower levels I got but few specimens of any form of life, save a few insect larvæ. Both the takings showed *Daphnia pulex* with winter eggs ; while the November catch was remarkable for the large number of *Diaptomus castor*, with the external single ovary. Some of the *Daphnia* bore in the brood pouches goodly clusters of young ; many young specimens of *Daphnia* and *Diaptomus* flicked their way among the host.

In the slimy stuff scraped from a wood pile in the same pond, were found *Coleps hirtus*, *Bodo edax*, *B. lens*, and one



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of the collar flagellates, *Codosiga* (*codonosiga*) *botrytis*. The collar seemed covered with bacteria ; there were at least two contractile vacuoles at the hinder end. The length of the creature was c. 18$\mu$. ; the width c. 8$\mu$. Both brown and green hydra were taken from the same water.

Later in the same November, I had *Vorticella umbellaria*—with four bells on one stalk—under the $\frac{1}{12}$ inch objective. The transverse striations on the creature showed finely ; and I watched with fascination the food substances—mostly small flagellates—revolving slowly in the vacuoles ; while the vacuoles themselves with almost imperceptible movement passed down and then up the body of the bell.

Winter observations are often limited to the stuff in one's jars. I kept an eye on a *Corethra plumicornis* larva, in moments snatched from sermon-writing ; it was motionless for long periods of time—in one case about forty minutes—at a distance of from three to six inches below the level of the water. The pupa also would remain suspended from nothing in particular at about the same distance ; then jerk its way to the surface, take in air, and drop to the lower level, and so remain for fifteen minutes at a stretch, apparently meditating its future career. The ordinary gnat larvæ and pupæ are less philosophic ; they fuss about, and twist and turn, even when hanging on to the surface film of the water.

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## THE BLACK RAT (MUS RATTUS RATTUS) ON MERSEYSIDE.

### Evidence that there is No Plague Danger.

ERIC HARDY.

We have heard a great deal lately about the supposed increase of the plague-carrying black rat, or ship-rat (*M. rattus*), and the alleged menace of the Middle Ages ' black death,' based solely upon some conclusions from certain parts of London. Some writers have added so much colour to the idea that they have given the ship-rat a new name—the Death Rat ! It has rightly been suggested that evidence should be gathered from Liverpool and other big shipping centres before any general conclusion be arrived at, and one would have thought the British Museum officials would have had sufficient scientific knowledge to examine the question at the biggest shipping centre—and rat centre—in the country, before launching such a strange plague-scare as has been launched. The popular press, however, has greatly exaggerated the facts.

As soon as the increasing ship-rat story was launched, I made an investigation at the biggest shipping centre, and rat centre, in the country—Merseyside—which handles one-

seventh of the world's shipping tonnage, and at which the introduction of all species of rats into this country was largely responsible. With the help of the port sanitary officials (who told me this was the first they had heard of the plague-rat menace) we found abundant evidence that the ship-rat (*M. rattus*) is fast on the decrease. We found no evidence to support the plague theory.

Rats of all species are declining at Liverpool, mainly due to the wonderfully efficient port sanitary conditions, and though over twenty official rat-catchers are engaged all the year, and the rat war was intensified, the number of rats killed at the port show a drop of about one thousand each year during the past four years, showing their numbers are decreasing. The record book of rats killed at the port, which I have examined, showed 17,073 in 1924, 16,300 in 1930, 15,813 in 1931, 14,975 in 1932. The average number of black rats (*M. rattus*) per ship has been reduced from 58.83 in 1923 to the low level of 2.02, mainly owing to compulsory fumigation of ships, and all large vessels being rat-proof. This is very important evidence against the Hinton theory. A census taken the other year for the distribution of the rats showed that in city warehouses and sewers brown rats (*M. decumanus*) exceed black rats (*M. rattus*) in the proportion of 9 to 1 ; on the dock quays their numbers are equal, while on ships, black rats exceed brown in the proportion of 139 to 1. A special investigation by the Liverpool School of Tropical Medicine found five species of fleas on rats in the port, the plague flea, *Xenopsylla cheopsis*, occurring freely on ship-rats ; but of 3,173 rats recently examined, none showed any signs of plague baccillus. When the *City of Oxford* arrived from the Mediterranean in 1932, eleven rats carrying trypanosomes of bubonic plague were found on the ship, but medical examination of the crew showed no infection, and fumigation killed all the vessel's rats. Port sanitary conditions have so advanced during recent years that only those completely ignorant of conditions could suggest they could not adequately cope with any plague outbreak. To suggest such is an insult to modern hygiene. Four species of rats normally at Liverpool, Birkenhead, Runcorn, and Manchester —the brown rat, black rat, Alexandrine rat (*M. rattus alexandrinus*), and tree rat of India (*M. rattus frugivorus*). True, there was recorded a dead black rat on the sandhills a few years ago, near Southport, a rare locality, but farmers on the Mersey shores above Garston tell me they often shot black rats before the war, when ships were broken up there, but they have not seen one for years. The black rat is definitely on the decline on Merseyside—thanks to our port sanitary officials.

*1934 Jan. 1*

## RECORDS.

UNCOMMON MARINE FISHES NEAR SCARBOROUGH—W. J. CLARKE.

On October 23rd, 1933, the s.t. *Star of the Isles* took in its net, 41 miles N.E. off Scarborough, a fine example of the Bergylt, or Norway Haddock (*Sebastes norvegicus*). The fish measured two feet in length, and was of a very brilliant orange-red colour. Unfortunately, I was just too late to secure the specimen, which was sold for 1/- to a gentleman who took it home and ate it. This is the first North Sea example I have seen but it is said to occur sparingly. The fishermen get them in Iceland waters, and call them ' soldiers ' in reference to their red colour.

The Gold-Sinny Wrasse (=Jago's Gold Sinny=*Ctenolabus ruprestris*). Fishing from the pier at Scarborough, on November 20th, 1933, the writer captured several small coalfish, locally known as ' billet.' On cleaning these, in the stomach of one of them was found this little fish, 1½ inches in length. It was quite fresh and had apparently just been swallowed. In the process the tail had got broken off and the fins were much damaged, so that I was not certain of the species, but Mr. J. R. Norman confirmed the identity of the specimen. This appears to be a very rare fish in Yorkshire waters and I can find but two previous records. Four were taken at Redcar by Meynell in 1844 ; and Mr. F. Snowdon, of Whitby, has informed me that several were found on the beach on March 8th, 1883, by a man named George Kitching, a local naturalist, who took one of the fish to Mr. Stephenson, from whose list of the local fishes these details have been extracted. The specimen is still preserved in the Whitby Museum, and measures about six inches in length.

An Allis Shad (*Clupea alosa*) measuring about fourteen inches in length, was caught in the trawl off Scarborough on November 23rd, 1933. I was not able to ascertain the exact ground where the boat had been fishing.

On December 12th, 1933, three examples of the Twaite Shad (*Clupea finta*) were captured, one by s.t. *Connie*, fishing ten miles N.E. off Scarborough, the other two by the s.t. *Isle of Wight*, thirty-four miles S.E. Although not great rarities, neither of these fish is of frequent occurrence in local waters.

On December 5th, 1933, a Lesser Forkbeard or Tadpole Hake (*Ranicepo raninus*) was washed ashore in the South Bay at Scarborough. It measured eleven inches in length. This is the eighth example I have seen near Scarborough, all but one of which were stranded. As they occurred both in winter and summer, it appears that they are resident off our coast.

On December 11th, 1933, a small example of the Garfish (*Rhamphistoma belone*) was washed ashore, much damaged by the breakers, but quite fresh, on the south beach at Scarborough. This is the first time I have seen this fish during the winter, although it is common during August and September.

PIGMY SHREW (*SOREX MINUTUS*) AT REIGHTON—W. J. CLARKE.

On November 6th, 1933, a Pigmy Shrew was caught by Mr. T. Hyde-Parker, of Reighton, in a mouse-trap set in his house. It was fully identified by the dentition, length of tail, and other characteristics which distinguish this tiny mammal from its larger relative, the Common Shrew.

Mr. Hyde-Parker also tells me that he found another example of the same species lying dead on the road near the Dotterel Inn, about two years ago.

This little animal is not very often seen, and no doubt escapes observation owing to its great resemblance to its larger and commoner relative.

LIOGMA GLABRATA MG. IN YORKSHIRE—CHRIS. A. CHEETHAM.

I find I caught this species in a moist wood near Ingleton on the 17th of July, 1926. I had mistaken it for a Cylindrotoma and put it aside in a store-box. With this addition we now know the whole four genera of the Cylindrotominæ are found in Yorkshire.

This small group is included in the Tipulids with short palpi, Osten Sacken[1] considered them to be one of the oldest types of the Diptera; he says the group was represented by many species in the Oligocene period in North America. Bengtsson[2] regarded them to be the most primitive form of existing Diptera. These ideas were based on their curious larvæ, which resemble in many ways the larvæ of the moths and butterflies. The one best known to naturalists is the green, apparently hairy, caterpillar-like larvæ of *Phalacrocera replicata*, Schn., whose life history was published by Miall and Shelford.[3] It is not uncommon with us and to watch the female as one easily can on Austwick Moss, see her alight on the surface of a pool and choose out the Hypnum moss, carefully and unhesitatingly passing over any Sphagnum is very interesting and shows this species is a natural bryologist.

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[1] *Trans. Ent. Soc.*, Lond., 1897, p. 362.
[2] *Acta. Univ. Lund.*, 1897, No. 7.
[3] *Trans. Ent. Soc.*, Lond., 1897, p. 343.

We have very few insects or animals that can make use of mosses for food, this being perhaps the most noticeable.

Little is known of the habits of the larvæ of Liogma or of Triogma ; both have much stiffer and less hair-like spines, and the latter appears to live in peaty matter. A paper by Taylor[1] gives an interesting description of the habits of the larvæ of Cylindrotoma which Mr. H. Britten found on the leaves of the Marsh Marigold in May, 1930.

This last species seem to be very variable in venation, some of the smaller cross veins are found in varied positions, and Dr. F. W. Edwards finds a difference occasionally in the stigma ; he also says that Continental specimens vary a good deal. Mr. Britten also finds this variation of venation, and illustrations (Meigen, V. de Wulp, Lindner, Pierre) show the same thing. There may possibly be more than one species ; the insect is not often found in quantity with us, but odd specimens are not infrequent, and it may repay more collecting and investigation.

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## WILD PLANT CONSERVATION BOARD.

As Representative of the Yorkshire Naturalists' Union, Mr. T. Sheppard attended the meeting of the Wild Plant Conservation Board held at the British Museum (Natural History), London, on Tuesday, November 14th, 1933. Dr. G. F. Herbert Smith was in the chair, and by invitation Major F. H. T. Jervoise, of the Central Landowners' Association, and Mr. R. K. Liddon, of the County Gentlemen's Association, were present.

Among the subjects discussed were : Memorandum on the Protection of Wild Flowers ; Re-establishment of May Lily in Ken Wood ; Alpine Plants on Snowdon ; *Ranunculus ophioglossifolius* at Up Hatherley, Cheltenham ; Church Missionary Society ; Legislation ; Wild Plant Seeds Distribution ; Schedules of Wild Plants ; Braunton Burrows, Devon ; Multiple Shops and the sale of large quantities of wild flowers ; and the Primrose League, it being suggested that artificial instead of real primroses should be used on Primrose Day.

The Hon. Secretary read the reply from Sir Austen Chamberlain to Sir Maurice Abbot-Anderson with reference to an article in *The Countryman* of January, 1933, in which he had referred to the use of a trowel for collecting specimens. The reply stated that he had no intention of encouraging the breaking of the law or the destruction of plant-life anywhere, and that in his opinion the danger to the countryside did not

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[1] *North West Nat.*, 1931, p. 17.

come from the real plant lover who occasionally collected a plant for his own garden.

Sir Maurice read extracts from various newspapers and journals referring to action subversive to the protection of wild flowers, and asked for a standard letter which he could in future send on the authority of the Board in such cases. A suggested draft was submitted. The Board decided that such matters should be referred to the Hon. Secretary of the Board for necessary action on its behalf.

Sir Maurice also called the attention of the Board to the position of certain Counties which have so far only adopted the old Bye-law for the Protection of Wild Plants, or none at all, and yet have applied to the Board to be furnished with a schedule of wild plants for protection. Cærnarvon and Glamorgan have no Bye-law. It was agreed that the County Councils may have applied for the schedule as a first step towards consideration of the necessity for passing the Bye-law.

With regard to the May Lily in Ken Wood ; Mr. Gilmour, being asked to report on the progress of this matter, reminded the Board of its resolution passed about a year ago to the effect that they approved of reintroductions of plants in places where the species had formerly grown. About the same time the Authorities at Kew had been approached and asked to replace the May Lily in Ken Wood, where it had accidentally been exterminated by the County Council in the construction of a new footpath ; through the kind offices of Sir William Lawrence, the L.C.C. had given permission for this to be done ; a stock of the plant had been obtained from a wild locality near Scarborough, and introduced in two places in Ken Wood in February of this year. This reintroduction was recorded in the *Journal of Botany* for June. The last visit paid to the locality showed that the plant was flowering and looked as though it would become well established. The Board expressed their appreciation of the services of the Director of Kew and Mr. Gilmour and Sir William Lawrence in the matter.

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**Exploring the Animal World,** by **Chas. Elton,** pp. 115. 3/6. (Allen and Unwin, Ltd.) This volume is based on a series of broadcast talks given under the auspices of the British Broadcasting Corporation. It is extremely readable and at the same time summarises a variety of topics in an interesting manner. As might be expected from the author, there is a very lucid account of the way in which animal numbers are affected by the presence of other animals and the bearing of these relationships upon the maintenance of bird sanctuaries and upon plagues of animals. We should like, particularly, to support Mr. Elton's plea that more attention should be given to detailed records of the animals in particular areas. He points out that we hardly know anything about the differences between, for example, an oak wood and a pine wood, to take only two simple cases. This type of work does not require highly specialised knowledge but rather systematic recording. These records are at present almost non-existent.

## VERTEBRATE ZOOLOGY SECTION MEETING.

A Meeting of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the library of the Church Institute, Leeds, on Saturday, October 28th, 1933, Mr. Rosse Butterfield occupying the Presidential Chair.

The Sectional Meeting was preceded by meetings of the Yorkshire Wild Birds and Eggs Protection Acts Committee and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee.

At the Sectional Meeting, the Minutes of the previous meeting were read and approved as also were the Annual Reports of the Divisional Officers of the North, East and West Ridings and of the York district. The Divisional Officers were Messrs. W. J. Clarke, C. F. Proctor, H. B. Booth and S. H. Smith.

The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts' Committee, and the Report of the Yorkshire Mammals, Amphibians and Reptiles and Fishes Committee were read and approved.

Mr. Rosse Butterfield was re-elected as President for a further year, Mr. C. W. Mason was appointed Divisional Officer for the East Riding, and Mr. R. Chislett was appointed Representative on Executive for the Wild Birds and Eggs Protection Acts Committee.

At the afternoon meeting, Mr. C. F. Procter referred to the Wren that last year nested in the carcase of a Kestrel hanging on a keeper's gibbet at Hornsea, and exhibited the remains of two Carrion Crows taken from the same source, in both of which Wrens had nested this year.

Mr. Proctor also referred to Mr. Ralph Chislett's recently published book entitled *Northward Ho* for Birds, which has already been reviewed in *The Naturalist*. He referred to the privileged position of the section in including so renowned a Naturalist and bird photographer, to the beauty of the illustrations, the rarity of many of the subjects portrayed and the value of the subjects matter.

Mr. W. F. Fearnley showed and described a length of cinematograph film entitled ' Glimpses of Wild Bird Life,' which dealt with a large number of different species of native birds. Perhaps the most interesting section was that dealing with the bird life of Bempton Cliffs, when one received the impression of being actually lowered down the cliff face and of seeing the Guillemots, Puffins, Kittiwakes, etc., at close quarters. The powerful and soaring flights of the Fulnar Petrel was also remarkably well shown.

A characteristic of the moving picture is the possibility of illustrating the peculiar habits of a species in a short length of film. The Spotted Flycatcher hawking for flies, the Common Sandpiper jerking head and tail and the erratic running actions of the Ringed Plover, may be cited among many other examples.

Mr. Rennie Wood then gave an illustrated paper entitled ' The Merlin and other Moorland Birds.' He stated that the Merlin was well distributed along parts of the Yorkshire-Lancashire border where it almost invariably chose a nesting site open to the South or South-East and with a very extensive view. Five eggs were usually laid in this locality and the domestic duties were undertaken by the female, though on one occasion the male was photographed brooding the eggs and to all appearances fast asleep on the nest. It was noted that the Merlins avoided walking and that, on alighting seven or eight feet from the nests, would again take wing to alight in the nest. The young were blind for the first twenty-four hours and were brooded for the first ten days.

On one occasion the mother bird left the nest and in her hurry kicked one of the newly-hatched young out of the nest. On returning, she brooded the other three and then noticed the odd one. She then left the others and brooded it, shuffling gradually back to the others, until

her family was once more reunited. One photograph was unusual in showing both birds at the nest.

A second series dealt with the home life of the Sparrow Hawk. The birds built their own nests, which contained six eggs and was lined with pieces of bark. A week later the nest was covered with white down, which had apparently originated from the brooding female bird. The period of incubation was 32 days and occasionally the cock bird visited the nest. The young were first fed with the entrails of a small bird, the mother herself disposing of the tougher portions. They were generally fed between 2 and 2-30 and again between 4 and 4-30 and brooding continued for eleven days. Many of the birds brought to the nest had been plucked and could not be identified but the Chaffinch and Song Thrush were noted. The difference in the colour of the irides of the two sexes was very marked.

Mr. W. G. Bramley gave an illustrated paper entitled ' A Dismal Swamp and its Avian Problems,' and dealt with the formation of a large sheet of water near Fairbarn, which was the result of land subsidence due to coal mining in the vicinity. This lake is only marked on very recent maps and extends to a length of well over a mile and a width of one quarter to three-quarters of a mile.

Before mining commenced the land was subject to temporary flooding, but later it was noticed that the flood water took longer to get away and that the low-lying parts were becoming water-logged and forming permanent pools. Reeds and rushes established themselves and the transition between feeding grass lands and swamp could be observed as the area of water extended. Beds of bullrushes and flags aud large patches of equisetum appeared while the remains of dead hedges, showing above the surface, marked the old field boundaries.

The water is kept fresh by the dykes draining the surrounding country and by springs. The outlet is into the river by means of sluice valves, and a sixty foot flood bank of pit waste now prevents flooding from the river.

The bird life of the area is full of interest and changes from year to year. This year has witnessed a marked diminution in the numbers of the Sedge Warblers and Reed Bunting, and a small colony of Reed Warblers has disappeared in recent years.

Up to 1926 the Great Crested Grebes numbered about six pairs, but since then they have greatly increased and it is difficult to estimate the number of pairs actually nesting. On June 25th, a fairly thorough search revealed five nests with eggs, and three or four broods of young were seen. The Grebes arrive in mid-February and depart at the end of October. A few pairs of Little Grebes also nest and a Slavonian Grebe was seen for a few days in February, 1926.

The Tufted Duck and Pochard have decreased of late, but the Shoveller has increased and about a dozen pairs were present during the breeding season. Several pairs of Mallard also nest round the lake and large flocks of this species are present in the winter months. A few pairs of Teal also nest in the vicinity.

Tufted Duck, Pochard, Shoveller and Wigeon sometimes appear in large flocks in the winter time, and it was noted that the Pochard are the last to return after a spell of hard frost. Two pairs of Pintail were noted in December, 1922, and a female Sinew in January, 1924.

Of late years the Black-Headed Gulls have decreased in numbers, but Coots and Water Hens are present in considerable numbers.

Snipe, Redshank and Lapwings nest sparingly in the rushes and sedges at one end of the lake.

Mr. W. J. Clarke exhibited a number of coloured lantern slides illustrating the habits of the Water Hen, Coote, Mallard and Water Rail. The photographs were taken at the Scarborough Mere, and were interesting in showing that wild birds can adapt themselves perfectly to a sheet of

water much frequented by the pulbic. The Water Hens frequently build their nests in the pleasure boats, which are let out for hire, and are always left in possession until the young have been reared. These birds do not fly into the selected boat but prefer to walk up the mooring rope.

Several interesting Yorkshire Marine Fishes were also illustrated and described, including the Snake Pipefish, the Great Pipefish, the Worm Pipefish, the Black Sea Bream and the Twaite Shad.

Finally, a vote of thanks to the lecturers and the lanternists was proposed and carried unanimously.

## FURTHER INSECT CAPTURES AT RIPON.

J. R. DIBB, F.R.E.S. AND W. D. HINCKS, F.R.E.S.

A Report of the Y.N.U. excursion to Ripon district during August Bank Holiday has already appeared in *The Naturalist*, pp. 230/237, 1933. We were able to join the main party for the investigation of the River Skell on the Monday. Unfortunately, the report of our captures has been too late for inclusion in the above. It may be of interest, therefore, to record the following insects in addition to those previously referred to.

### Coleoptera.

Beetles were extremely scarce and the only species taken were :— *Platambus maculatus* Linn., very abundant in the River Skell, several examples being almost immaculate ; *Deronectes sanmarki* Sahl. *ab. rivalis* Gyll. ; *Lathelmis volckmari* Panz. ; *Limnebius truncatellus* Thunb. ; *Notiophilus biguttatus* Fab. ; *Cionus scrophulariae* Linn.

### Diptera.

Numbers of common *Syrphididae* were observed including the following species :—*Liogaster splendida* Meig. ; *Chrysogaster solstitialis* Fall ! ! ; *C. splendens* Meig. ; *Chilosia pagana* Meig. ; *C. vulpina* Meig. ; *Melanostoma ambiguum* Fall. ; *Ischyrosyrphus laternarius* Mull. ; *I. glaucius* Linn. ; *Epistrophe cinctella* Zett. ; *E. balteata* Deg. ; *E. umbellatarum* Fab. (1 ♀ by Mr. Wood) ; *Syrphidis ribesii* Linn. ; *Eristalis arbustorum* Linn. ; *E. pertinax* Scop. ; *E. horticola* Deg. ; *Myiatropa florea* Linn. ; *Tubifera pendula* Linn. ; *Zelima segnis* Linn.

The other Diptera included :— *Graphomyia maculata* Scop. ; *Cyanomyia mortuorum* Linn. ; *Rhagio tringarius* Linn.

### Ephemeroptera.

The dominant species on the River Skell, at the time of our visit, appeared to be *Ephemerella notata*, which was present in fair numbers. Adults also were taken of :—*Centroptilum luteolum* Mull. ; *Habropvlebia fusca* Curt. ; *Cloeon dipterum* Linn. ; *Ecdyonunnus sps*♀ ; *Bætis rhodani* Pict.

Nymphs were not very abundant in the River Skell. The following genera were represented :—*Ephemera, Ecdyonurus, Bætis, Paraleptophlebia, Ephemerella.*

### Hymenoptera.

The only Saw-flies seen were *Selandria serva*, and a single specimen of *Hemichroa crocea* taken by Mr. J. M. Brown.

## REVIEWS AND BOOK NOTICES.

**Functional Affinities of Man, Monkeys, and Apes,** by **S. Zuckerman, M.A., D.Sc., M.R.C.S.** With 24 illustrations (photographic reproductions) of various monkeys and apes, 1-178 pp., size 5 in. by 8 in., published in 1933 by Kegan, Paul & Co., Ltd., London, price 10/6. A truly scientific attempt to use the comparative physiology, behaviour,

pathology, and even parasitology of the primates as an indication of their natural affinities. That such considerations would shake the solid conclusions based on comparative anatomy was not to be expected, although some minor discrepancies are pointed out. The only disappointment one feels arises from the fact that the author cannot give us more information : the available data are too scanty. He often rouses our curiosity without being able to satisfy it. In all its purity of scientific analysis it remains very readable to the lay reader. One leaves the book feeling that once more the intricacies of the process of evolution have been demonstrated. It would appear that in the group of primates the key to their evolution lies in a deep study of their reproductive mechanisms and their comparative behaviour.

**Jottings of a Nature Lover,** by **Charles L. Rothera,** pp. 120, J. and H. Bell, Ltd., 2/6 net. Mr. Rothera was one of the pioneers in the promotion of that type of adult education which finds its expression in Literary and Scientific Societies, University Extension Courses and the like. This book is a compilation of notes which appeared many years ago in *The Nottinghamshire Weekly Guardian,* and deals very happily with the year's round in wild nature. The book is readable and should stimulate an interest in Natural History among beginners.

**Wild Life Stories,** by **Maribel Edwin,** pp. VIII+280, Nelson and Sons, Ltd., 3/6 net. This is one of a new series of books to be called **The Nelsonian Library** and the volumes are intended for young people. This book will suit readers of any age over thirteen and can be strongly recommended. The essential events in the stories are true to nature and the form adopted makes for very good reading.

**Hunting Wild Beats with Rifle and Camera,** by **C. T. Stoneham,** pp. VIII+220, Nelson and Sons, Ltd., 7/6 net. The author has spent many years as a game hunter in Africa, but realises that animal photography is almost if not quite as good a sport as killing. The book is full of interesting and sometimes thrilling anecdotes of adventure, and the author's opinions and comments are of a kind to command respect. Like most educated observers, he condemns indiscriminate slaughter and instances the effects of such action in the past. At a time when considerable interest is being shown in the assessment of the economic value of this creature and that, it is well to be reminded that in some places Seals have been wiped out to protect fishing grounds but that the fish have vanished along with the Seals ; that enormous numbers of wild game were slaughtered in Rhodesia on the ground that they encouraged the tsetse fly, yet the tsetse is actually spreading in Rhodesia. There are nearly 50 photographic illustrations in the book most of which are good and some excellent.

**The Ecology of Animals,** by **Chas. Elton,** pp. 97, 3/6 net. (Methuen and Co. Ltd.) This little volume is a further excellent addition to Messrs. Methuen's series of biological monographs. It surveys in a broad manner the questions involved in ecological surveys, animal inter-relationships, habitats, the statistics and dynamic aspects of animal numbers. A final chapter deals with the economic results of ecological work. Animal ecology is still very much in its infancy in this country, and it is probable that this little book will do much to stimulate its development. To naturalists in general, the treatment of the sections dealing with the factors controlling the number of animals in a given habitat will undoubtedly prove stimulating and it does much to emphasise the importance of periodic censuses of a given species. Mr. Elton's view is, in brief, that the present arguments definitely suggest that periodic cycles of numbers are inevitable in any one species of an animal population. This is definitely a very useful summary of the problem.

**The Natural History of the Hake. IV,** by **C. F. Hickling,** pp. 120 (Ministry of Agriculture and Fisheries : H.M. Stationery Office, 5/6 net). In this continuation of studies on sea fishes, the author discusses the data obtained as to the age and growth rate of the Hake on the Atlantic fringes of the British Isles. The data were obtained by analysing single groups of fish in commercial catches and by examination of a large number of otoliths. It is shown that the largest and oldest fish occur in deep water.

**Animal Stories from Andrew Lang,** pp. 491, 7 coloured plates, 100 illustrations. (Longman's, Green and Co. Ltd., 6/- net.) This book is a good selection from that perennial source of interest, Andrew Lang's *Animal Stories*. It is well printed and profusely and excellently illustrated. The actual selection of the stories was carried out by a damsel of seven and a half years old, so that it may safely be assumed to represent the juvenile taste. Older persons would find it hard to cavil at the selection. It is clearly a book to be recommended.

**Plants and Human Economics,** by **Ronald Good,** pp. 202, 8 maps, 5/- net. (Cambridge University Press.) The publication of Mr. Good's book is a welcome occasion, since it emphasises in very definite terms the importance of plants in our economic life. ' In all human communities, the fundamental biological needs of the human body require that an adequate supply of food stuffs shall be the fundamental basis of their economic organisations. Some achieve this by home agriculture . . . . . others again almost exclusively by international trade.' We in Great Britain belong to the latter class, and it is only in moments of great stress, such as during the critical months of the Great War, and again at the present, that we are brought to realise this vital fact. Mr. Good marshals in concise and convincing fashion the facts which prevent Great Britain from producing an adequate food supply for its own population.

The greater part of the book is, however, concerned with facts of a different type. It deals with the plants from which our foods and raw materials are derived. These are treated under the various headings, Cereals and Pulses ; Vegetables and Fruits ; Beverages ; Sugar, Oils and Fats ; Spices ; Timber, coal, and Petroleum ; Rubber, Resins, Gums, Tans, Dyes, Fibres, Alcohols, Drugs, Fodders. A careful examination seems to show that no common economic plant is excluded. The chapters are not, however, mere lists of names. They incorporate a wide fund of incidental information, which ranges from antimacassars to carats and includes such topics as the mutiny of the Bounty (in discussing bread fruits) ; the treatment of the subject, which might easily have been dull though informative, is, in fact, very happy and extremely readable. About six hundred plant names are included, and these names are tabulated for reference with the commercial names of the products in an appendix. The breadth of treatment of the subject is, however, a very notable feature of the book, and the chapters on science and agriculture, the economic botany of Great Britain and factors limiting agricultural production are extremely useful and wide summaries. The book can be recommended.

**All the Other Children,** a book of young creatures, by **C. Fox Smith,** pp. X+102 with 51 illustrations, Methuen, 7/6. This book contains a series of exceedingly well chosen photographs of juvenile members of the families of many wild creatures. The letter press accompanying each photograph is a model of what such descriptive matter should be. The book will give great pleasure to the youngsters when their parents can be induced to part with it.

# THE YORKSHIRE NATURALISTS' UNION'S SEVENTY-SECOND ANNUAL REPORT FOR 1933.

(**Presented at Leeds on Saturday, December 9th, 1933.**)

**The Seventy-first Annual Meeting** was held in the Bankfield Museum, Halifax, on Saturday, December 10th, 1932, and the Annual Report was published in *The Naturalist*, January and February, 1933, pp. 12-24, and 38-48.

**The Presidential Address,** on 'Sand Grains and Sandstones,' was delivered by Professor A. Gilligan, D.Sc., F.G.S., M.I.M.E.

**The Editorship of the Naturalist.**—The Executive accepted with regret the resignation of Mr. Thomas Sheppard, M.Sc., F.G.S., as Editor of *The Naturalist*, an office he had filled since January, 1903. As a mark of appreciation for his services a portrait of himself, together with a cheque subscribed by Members and Associates of the Union was presented to Mr. Sheppard at the close of the Presidential Address, and a report of the proceedings is printed on page 2 of the current volume of *The Naturalist*.

The Editorship of *The Naturalist* was offered to, and accepted by, Dr. W. H. Pearsall, F.L.S., and Mr. Wm. R. Grist, B.Sc., in a joint capacity.

**The Presidency for 1934** has been offered to, and accepted by, Mr. F. A. Mason, F.R.M.S., for his services to the Union, and his contributions to the study of Mycology in Yorkshire.

**Field Meetings** have been held during 1933 as follows :—Robin Hood's Bay, Easter, April 15th to 17th ; Skipwith, Saturday, May 13th ; Dent, Whitsun weekend, June 3rd to 5th ; Ripponden, Saturday, July 8th ; Ripon, Bank Holiday, August 5th to 7th ; Fungus Foray, Barnard Castle, September 16th to 21st.

Reports of all these meetings have appeared in *The Naturalist* during the year. In addition there have been Sectional Field Meetings for Conchology at York, on Saturday, June 10th, and at Brock-a-Dale, Saturday, September 9th, and for Freshwater Biology, at Ripon on the occasion of the Union's visit, during the weekend August 5th to 7th.

**The Annual Meeting** will be held at Braford on Saturday, Dec. 8th, 1934.

**The Excursions for 1934** will be as follows :—

| | |
|---|---|
| April 14th to 16th ... ... | ... Farndale (N.E.) |
| May 19th to 21st (Whit Weekend) | ... Bainbridge (N.W.) |
| June 16th ... ... ... | ... Fairburn (Mid. W.) |
| July 7th ... ... ... ... | ... Flamborough (S.E.) |
| August 4th to 6th (Bank Holiday) | ... Goole (S.W.) |
| September 15th to 20th ... | ... Fungus Foray, Ingleton. |

**Membership.**—The following new members have been elected during the year, making a total of 301 :—

Balmforth, Mrs Ruth, B.A., 40 Longlands Road, Huddersfield.
Bedford, Dr. T. Henry B., The Medical School, The University, Manchester, 13.
Bilbrough, Mrs. L. M., 31 Stonegate Farm Road, Meanwood, Leeds.
Butterfield, J. A., M.Sc., F.G.S., City Training College, Leeds.

Cauldwell, Rev. W. H., The Manse, Stainland, Halifax.
Crapnell, V.S., 51 The Grove, Hipperholme, Halifax.
Cushin, W. H., B.A., F.R.G.S., Grace Ramsden's School, Elland.
Duncan, Miss J., B.Sc., Ph.C., Pharmaceutical Department, The University, Manchester, 13.
Fenton, W. C., M.C., J.P., Fieldhead, Cleckheaton.
Fox, C. E. F.S.I., 1 Harrison Road, Halifax.
Gaynor, Dr. J. S., Hull Cottage, New Earswick, York.
Longbottom, Maurice, Cartwright Memorial Hall, Bradford.
Osteide, H., 11 Newton Grove, Chapeltown Road, Leeds.
Stainforth, T., B.A., B.Sc., 145 Westbourne Avenue, Hull.
Thomas, Miss M., B.Sc., 60 Stratford Street, Dewsbury Road, Leeds.

**Affiliated Societies.**—It is regretted that the Leeds University Natural History Society does not see its way to continue in affiliation with the Union. The number of Societies now affiliated is 37, with an aggregate membership of 2,925, bringing the total strength of the Union up to 3,126.

**Obituary.**—A heavy death roll marks the current year, and the Union deplores the decease of ten members: F. W. Branson, A. I. Burnley, G. R. Carline, Judge Chapman, Canon Robert Fisher, Chas. Mosley, H. Osteide, W. H. St. Quintin, A. R. Sanderson, E. W. Thirkell.

**Delegate to the British Association** and to the **Wild Plant Conservation Board of the Council for the Preservation of Rural England** respectively, Mr. Thos. Sheppard, M.Sc. Your delegate reports that he attended the meetings of both Societies and took part in the deliberations of each.

**Centenary of the London Entomological Society.**—Your delegates, Mr. J. M. Brown and Mr. M. L. Thompson, attended the Centenary Celebrations of the Entomological Society of London, which took place on the 3rd to 5th of May, 1933. On the afternoon of the Wednesday a General Reception of delegates from most parts of the world was held in the Rooms of the Royal Geographical Society, at which Congratulatory Addresses were received by the President, Professor E. B. Poulton, F.R.S., among which was one from the Y.N.U. An announcement of great interest was that the King had been pleased to add to the prestige of the Society by conferring upon it the dignity of a Royal Society. A Scientific Conversazione was held in the evening in the Society's Rooms. The meetings were continued on Thursday and Friday, and included Receptions by His Majesty's Government at Lancaster House, by the Trustees of the Natural History Museum at the Museum, by the Zoological Society at the Zoological Gardens, and for the foreign delegates by Lord Rothschild at the Tring Museum.

**The Naturalist.** The Executive congratulates Dr. W. H. Pearsall and Mr. W. R. Grist on the completion of the first volume of your Journal under their Editorship, and it appreciates the amount of work involved and the difficulties successfully overcome in connection with its publication. They report: *The Naturalist* continues to maintain a satisfactory standard. They now feel that the period of transition is over, and that the difficulties of the first few months have largely resolved themselves. They would appreciate expressions of opinion on the present form of the Journal and any suggestions as to the type of article which is most valued by members of the Union. They have in mind the attempt to incorporate articles of general interest dealing with those aspects of natural history which are undergoing considerable development at the present time, and would welcome co-operation in this direction as

well as articles dealing with original observations. As *The Naturalist* is the property of the Union, it may be of interest to record that a far larger number of notes and articles is received from non-members of the Union than is contributed by members. While it is very desirable that *The Naturalist* should attract all types of contributors, a feature which will extend its circulation, the Editors would be glad to obtain more contributions from Yorkshire Naturalists.

**Members of the Permanent Committee.**—The following members were elected :—

Chas. Allen. J. L. Illingworth.
J. A. Butterfield. M. Longbottom.
Miss M. Wray.

## VERTEBRATE ZOOLOGY SECTION.

**West Riding** (H. B. Booth) :—Ornithological Notes.—The record fine and dry summer of 1933 has proved very advantageous to the successful nesting, more particularly to the ground breeders ; and all species of game birds have done exceptionally well.

After my report a year ago, a few remnants of the Waxwing incursion were noted. Two at High Utley, Keighley, on November 22nd and 23rd (Mr. R. Butterfield), and one at Shipley on November 20th (Mr. S. N. Andrews), and a small flock of six or eight birds in the Deer Park, Bolton Abbey, the last week in November until about December 2nd (Rev. C. F. Tomlinson).

In the *North Western Naturalist* (Vol. VIII, June 1933, p. 138), a male Golden Oriole was reported as having been seen by three observers on April 18th, at Hardcastle Crags, near Hebden Bridge.

Mr. A. Hazlewood assures me that the British Willow Tit (*Parus atricapillus kleinschmidti* Hellm.) is fairly common the whole year around Doncaster, where he says the British Marsh Tit is rarely, if ever, seen.

Mr. H. Thornton has proved that two pairs of Short-eared Owls have successfully nested in 1932 and 1933, on the moors near Ripponden. This is a good record, as hitherto all the reports of this species nesting in this Riding that have been investigated have proved to be those of the Long-eared Owl, which more frequently nests on the ground than is generally known.

As usual, several flocks, or ' gaggles ' of Grey Geese were reported, but December 14th was a great day for them. It is possible that there were several parties, as the estimates of the numbers by the observers varied so greatly. One report in the local press estimated one flock that passed over Great Horton, Bradford, as consisting of a thousand birds ! ! But the most reliable report I had for that day was from Mr. S. Longbottom, who carefully estimated a flock to be about one hundred and flying over Bingley, east to west. Again, on December 19th, there were reports of several gaggles in the neighbourhood of Bradford.

In the very severe frost from January 20th to 30th all the Wood Pigeons and Golden Plovers left this part of Wharfedale, but some Lapwings and a few Black-headed Gulls remained through it, chiefly by the help of the sewage beds and the river. On January 29th there were scores of Snipe on the sewage works, and I was surprised to see a single Redshank.

The Little Owl has successfully nested in 1932 and 1933 at Egypt, near Thornton, within the Bradford City boundary. One of the fledged young was shot and preserved (Mr. M. Longbottom). A Little Owl was shot at Chellow Dean, Bradford, on September 18th, 1932 (R.B.), and another was seen in the Bingley district in 1933 (Mr. Swaine).

A Hooded Crow was shot on Haworth Moor, beyond the Lodge, in June, by Mr. Hopkinson, the gamekeeper at Harbour Lodge (R.B.).

Herons.—In Lord Wood, Gargrave, we counted 26 occupied nests, most of them with hatched egg shells on the ground below. This is an easy record for this heronry during the forty odd years that I have known it. It must not be assumed that Herons are increasing wholesalely in this Riding. On the same day (April 23rd) Mr. W. F. Fearnley and I visited the heronry near Gisburn, and we found a great decrease from our visit in 1931, and we were informed that the gamekeeper was shooting the Herons. They had moved to a wood about a mile further west, and in the direction of Bolton-by-Bolland; so that our Lancashire friends, who call this the Bolton-by-Bolland heronry, will now be more justified. We found the birds very wild, and the nests difficult to see, as they are now built in thick Spruce. We flushed two birds from their nests, and found two other trees with hatched egg shells under them; so we assumed that this heronry was reduced to four—or possibly five—nests. I have not personally been able to visit the heronries at Hubberholme and Harewood this season; but from reports that I have received, the former is about the same, and that the latter is slightly reduced in numbers. In Grass Woods, the pair or two that we presume have nested there for several years, but we have but little proof this year. The birds were heard there in the nesting season, but neither the birds nor their nests could be seen in the tall thick Larches (R.B.). The pair that have attempted to nest at Westy Bank Wood, Bolton Abbey, for several years, were at the last successful in rearing a brood (Rev. C. F. T.).

Great Crested Grebes.—Mr. W. G. Bramley writes me that on two visits to Fairburn he estimated about ten to twelve pairs, so that although the numbers are decreasing slowly, there is still a good show. At Coniston Cold, although the Grebes visited the lake, they did not nest. Neither have they done so on Malham Tarn, which is probably due to the fact that a pair of Mute Swans built a nest on the site of the Grebes' nest of last year (Mr. Usher). I reported a year ago that there was good evidence that a pair of Great Crested Grebes had nested on Eshton Tarn for the first time. This year we had a great surprise. On May 21st we found a pair of Great Crested Grebes, and one (presumably the female) had one (or two) newly-hatched young on her back! I should have been almost afraid to record this early date but for the fact that I had seven Bradford ornithologists with me. We rather expected there would be a second brood, but on two later occasions on which this tarn was visited (one late in July) there was not any sign of a second nest or brood; in fact, only the old pair of birds were seen on each occasion. On Chelker reservoir, a pair of Great Crested Grebes have reared young (I believe for the first time), although they are usually there the whole season, and have frequently built nests, and have probably been robbed. On June 25th, the nest contained four very hard set eggs, and on July 16th the one young one had not only hatched, but was nearly half the size of its parent, and was almost ceaselessly diving for food. The following week I was reliably informed that there were two young Grebes on this reservoir, each in the charge of a parent. Mr. H. E. Shorney informs me that there were four pairs of Great Crested Grebes on the brickponds at Dringhouses near York, and that they reared about ten young ones.

Rooks.—Mr. Sam Clough informs me that there were 293 nests in the Steeton rookeries, an increase of 42 nests on last year, after a decrease the year before. But it must not be forgotten that for the last few years the young Rooks have not been shot, whilst previously they were shot each season. In the Ilkley area it has been a most disastrous year for the nesting Rooks. This year the nesting sites in and around Ilkley were reduced to one, and that was situated at the junction of Bolton Bridge Road with Skipton Road, and contained 26 nests. In the

interests of motor drivers, and by an order of the Chairman of the Ilkley Urban District Council, these trees were ruthlessly cut down on May 11th, and those young Rooks that were not killed in the fall were sprawling on the ground. This action caused a lot of indignant feeling, and it does seem a pity that the felling was not deferred another fortnight, when the young Rooks would have been able to fly. As it is, not a single young Rook has been reared this year within a mile and a half from Ilkley; but as I intend to write a special note in *The Naturalist* on the 'Passing of the Ilkley Rookeries,' I will leave this matter for the present.

*Re* 'Winter roosts,' we knew that Keighley was about the dividing place between the Rooks that roost at Eshton, and those that roost at Weston; but Mr. R. Butterfield sent me a most interesting note, viz., that Victoria Park, wherein Keighley Museum is situated, is the actual dividing line. Rooks on the west side of the Museum go west and presumably to Gargrave; whilst the Rooks on the east side take off in the opposite direction, making for Weston.

Other Stray Notes.—A Peregrine Falcon was shot by Scott, the gamekeeper in Howden Woods, near Keighley, at the end of August (R.B.).

A Common Buzzard was watched soaring in the neighbourhood of Fly Flatts reservoir in July, by Mr. Crapnell (per W. G.).

Mr. A. Haigh Lumby informs me that the Red-legged Partridge has inhabited and increased in the neighbourhood of Bishop Monkton, near Ripon, during the last two or three years. Hitherto this species has not been able to obtain a footing on our West Riding hills.

A small flock of Wigeon were on Ogden reservoir on December 1st (W. R. Verity). Four Shovelers were seen on the River Aire, first below Cottingley Bridge, on September 16th (R.B.). I flushed a flock of about twenty Pochards from Denton Park Lake, Ben Rhydding, on December 4th, and again on July 13th.

Corncrakes generally have been as quiet as ever. Mr. R. Butterfield informs me that two pairs have nested among nettles at the Leeds and Liverpool canal tip between Keighley and Silsden, and Mr. W. G. Bramley writes that they are common right up Wensleydale.

Odd Goldfinches have been reported throughout the winter.

Two or three pairs of Black-headed Gulls have nested at the sewage beds at Marley near Bingley this season (R.B.).

Variation in Plumage.—I don't know if albinism is affected by a warm dry spring and summer; but certainly this season we have had an exceptional number of albino, and partial albino, birds. Firstly, there was that beautiful albino female Song Thrush (at Menston), which I reported in *The Naturalist* (1933, p. 124). I only need add that this bird remained in the neighbourhood all the summer, and was frequently seen, but so far as was known, never attempted a second nest, against the normal three broods of the Song Thrushes in this area. This opens another question: are albinos defective in their reproductive organs?

Two more juvenile albino Cuckoos were reared on the Embsay and Eastley Moors, but I have already sent a detailed account to *The Naturalist*.

Three albino Twites were seen at close quarters by Mr. D. Sutcliffe on August 17th in a field on Snow Booth farm, near Wadsworth. They were perfectly white, and with a good pair of binoculars at close range he could see that they had pink eyes (per W.G.).

Mr. W. G. Bramley reports a very light coloured Sand Martin amongst a flock at Fairburn, and Mr. H. E. Thorney a curious Pied Wagtail at Dringhouses, near York, throughout September, which he describes as of 'a light grey or silvery colour all over.'

In addition, I have many reports of partial albino Blackbirds, House Sparrows, etc. The only one that calls for distinction is a hen Blackbird

at Dringhouses, York, which Mr. H. E. Thorney says has been knocking about for years. White feathers, although very frequent in the male Blackbird, are very uncommon in the female.

**East Riding** (C. F. Procter).—The season has been abnormal in so far that we have had very little rainfall during the breeding season. One result of this has been that many birds have nested twice, and some more than this. I feel certain that Water Hens are continuous breeders, for instance, and have noticed a peculiarity that the later broods seem to stop growing as autumn approaches, and do not attain adult size until after the following spring. This does not apply to earlier birds, bred in the spring or early summer, which grow up normally straight away.

Game has done well, and Partridges are more plentiful than they have been for many years. Hares and Rabbits have bred successfully right through the season. There are a great many Pigeons this year, and the increased growing of peas and beans for pig requirements seems to have produced an appropriate Pigeon population from somewhere.

Two young Otters were caught on the banks of the River Don at Rawcliffe, and were reported in the newspapers as ' two strange animals, probably brought over from foreign lands in ships trading into Goole, and escaped from thence up the river.' The prosaic explanation is probably very much removed from this. They were washed out of their halt by a 3-ft. spate, and at times like that, when food is bad to find, the family wanders a long way, and is scattered. They have been variously described by imaginative reporters as having ' eyes like ferrets, tails like beavers, faces like cats, skin like otters, feet like bears ' ; and so on.

One effect of the drought has been that there is no bottom growth in the stubbles, and I have seen a number of grass snakes, and considerable numbers of frogs and toads, and young frogs and young toads on stubbles. I attribute this to the fact that ditches and ponds have been dried up elsewhere, and they have been scattered more than usual. It may also be that in normal times there are greater numbers than we are aware of in the cover of the stubbles, but they are not generally seen. There must have been a great mortality among the amphibia and among eels and fresh water fish generally in many places, since ponds and creeks have been evaporated which have not been dry before in my memory.

**North Riding** (W. J. Clarke) :—Birds.—The usual fluctuations in numbers of certain species were again noticeable this year. Species which appeared to be more numerous than last year were Fieldfare, Golden Crested Wren, Wood Warbler, Sedge Warbler, Spotted Flycatcher, Reed Bunting, Kingfisher, Dunlin, Lesser Redpole, Greenfinches, and Long-tailed Tit.

Species which did not appear in their usual numbers were Whimbrel, Whinchat, Stonechat (one pair nested at Scarborough), Yellow Wagtail, Sand Martin, Brambling, Purple Sandpiper, Common Sandpiper, and Chiff Chaff.

A most interesting record is that the Raven has been reported recently in the Whitby district, where another example was trapped in May, 1930. It is not desirable to indicate the exact locality.

Hawfinch.—Two pairs nested successfully near Whitby, and others near Scarborough.

Goldfinches are reported as doing very well in the Whitby district, and they are still increasing about Scarborough.

House Sparrow.—A pure White variety was frequently seen during August at Saltburn. One all Black, above and below, lived about my garden at Oak Road, Scarborough, from January 23rd to February 3rd, 1933.

Snow Buntings.—A flock of about 50 were seen at Teesmouth on October 30th, 1932, too late for inclusion in last year's report. A few have been noticed in the Whitby district in 1933.

White Wagtail.—One was seen at Scalby Beck on September 19th, 1933.

Red Backed Shrike.—One seen near Ayton on May 21st, 1933, the third record for the Scarborough district.

Waxwing.—Occurred in some numbers during the close of 1932 and beginning of 1933. The following is a brief list of those seen :—5 at Peasholm, Scarborough, November 26th, 1932 ; 2 at Hodgson's Slack, Scarborough, November 27th, 1932 ; 1 at Scalby, November 28th, 1932 ; 2 at Hodgson's Slack, Scarborough, December 1st, 1932 ; 5 at Rillington, December 30th, 1932 ; 4 near Whitby, November 8th, 1932 ; 15 near Whitby, November 24th, 1932 ; 22 near Whitby, November 25th, 1932 ; 12 near Sleights, December 31st, 1932 ; 20 near Robin Hood's Bay, January 4th, 1933 ; several in Peasholm Glen, January 18th, 1933 ; 1 in Westbourne Grove, Scarborough, January 21st, 1933 ; 5 at Cloughton, January 26th, 1933 ; 4 at Scalby, January 26th, 1933 ; 6 at Scarborough, February 20th, 1933 ; 2 at Scarborough, February 27th, 1933.

Grasshopper Warbler.—One at Scarborough, May 11th.

Marsh Warbler.—One near Scarborough, June 29th. Watched for some time by Mr. T. N. Roberts.

Reed Warbler.—Seen at two localities near Scarborough on June 13th and subsequently. Nests not sought for in order not to disturb the birds.

Song Thrush.—One, nearly all White, seen at Scarborough on February 9th and subsequent dates.

Ring Ouzel.—Continues scarce about Scarborough, but has re-established itself near Whitby after being scarce for some time.

Black Redstart.—One was seen at Scarborough by Mr. H. E. Bentham on April 21st.

Nightingale.—One resided in Peasholm Glen, Scarborough, from May 2nd to May 26th, 1933.

Dipper.—This bird keeps up its numbers at all suitable places in the district.

Pied Flycatcher.—Occurred in several parts of the area, first seen at Scarborough, May 16th, several pairs nested in the Whitby district.

Hoopoe.—One flew on board a trawler off Scarborough on November 7th, 1932.

Montagu's Harrier.—Two, seen lately (October, 1933) near Whitby.

Peregrine Falcon.—A male seen at Scarborough, December 3rd, 1932.

Brent Goose.—Five of the White bellied variety frequented the North Bay, Scarborough, for several days in March, 1933.

Bean Goose.—One was shot on the Costa near Pickering in December, 1932.

Gadwall.—One shot near Reighton on December 31st, 1932.

Velvet Scoter.—Odd ones seen near Whitby during early part of the year, in company with Common Scoters.

Goosander.—One seen on Hackness Lake, 1933.

Pochards, Golden Eye, Scaup and Mallard visited the Scarborough Mere in some numbers during the winter. Numbers of the latter species remained to nest.

Curlews were in their usual numbers on the moors between Scarborough and Whitby, but Golden Plover were scarce.

Black-headed Gull.—About 300 birds were at Foulsyke on May 29th, many sitting, and they did not appear to have been disturbed. They were raided shortly after, however. The nesting site near Glaisdale

was also interfered with, and only 15 occupied nests could be found on May 27th, 1933, most of which contained only a single egg.

Great Black-backed Gull.—Large numbers passed Whitby during the September migration, about one-half of which were adult. This fine species is now present in Scarborough Harbour all the year round.

Sandwich Tern.—Very numerous off Whitby and Scarborough during the autumn migration, 1933.

Great Skua.—One collided with the electric wires near Thornton Dale, December, 1932, and was sent to York Museum.

Little Auk.—Storm-driven corpses were on Scarborough sands on February 23rd and 26th.

Fulmar.—Over 80 counted in the Scarborough Castle Cliff on January 29th, 1932. Continued plentiful all the spring and summer. There has been no increase in their numbers in the Whitby district.

Little Grebe.—Nested near Scarborough, where it has not been common in recent years.

Landrail.—More numerous in the Scarborough district than for several years past. Reported in its usual numbers at Whitby.

Coot.—Several seen on the river at Whitby during the winter. Firmly established as a breeding species near Scarborough.

The recorder is indebted to Messrs. T. N. Roberts, F. Snowdon, H. B. Booth, T. Hyde Parker, A. S. Frank, and the late W. H. St. Quintin for information used in compiling this report.

**York District** (Sydney H. Smith) :—The year opened in continued frost and deep snow throughout January. A few springlike days in February tempted rooks to clean up the old nests in the trees around the York County Hospital, but more snow and rain stopped them, and the frost held on until well into March.

The long dry summer favoured visiting birds, and their nesting season has been very successful, particularly Swallows and Martins. Game birds had a good time, and the hatchings of both Pheasants and Partridges have been very good.

There have been large numbers of Cuckoos in the York district, but again I have to report the remarkable scarcity of Landrails or Corncrakes, a species which has almost disappeared in this area, and I am at a loss to account for this curious decline.

Nightingales were heard at several places around York during May and June, and I have recorded the successful rearing of four young ones near Pocklington (*The Naturalist*, Aug., p. 177).

Little Owls are becoming very numerous in this well-wooded district, and they have been observed at Sandburn, Strensall, Buttercrambe, Bugthorpe, Askham Bogs, Terrington and Yedingham during the summer months. Mr. H. Shorney reports that three nests of the Little Owl were discovered along the railway embankment at Dringhouses when the grass was cut, but all were destroyed by boys out birds nesting.

Carrion Crows are too numerous from a keeper's point of view, but Hooded Crows, once so common, are seldom seen, two only being noticed on April 12th at Huntingdon, and which were still there on the 22nd.

Mr. J. Morris, the keeper at Skipwith, informs me that a pair of Pintail Ducks reared seven young ones on the Horseshoe Lake in June, 1932, and he hoped they would nest again this year, but as yet I have no report. He also told me that he estimated there were seven hundred pairs of Black-headed Gulls nesting on the ponds this year (1933), twenty pairs of Shoveller Ducks, twelve pairs of Pochards and fifty pairs of Teal Ducks. A Bittern was killed on the Common in 1932 much to his regret, as he had hopes of this species trying to nest there this year. A pair of Shoveller Ducks were seen on the lake at Strensall on April 22nd and may have tried to nest there.

Two pairs of Great Crested Grebes were seen on Leethams Pond, Dringhouses, on April 2nd, and one pair commenced nesting on April

4th. Another pair of these birds were observed on the lake at Sandhutton on May 1st. On May 7th a pair of Great Crested Grebes were sitting on eggs in a nest at Hepper's pond, Dringhouses.

Two pairs of Pochards were seen on Leetham's Pond, Dringhouses, on April 4th, but did not nest there.

A Tree Creeper's nest and eggs were found in Askham Bogs on April 6th, and a Gold Crest's nest and eggs at Dringhouses on April 29th.

Blackcap Warblers and several pairs of Bullfinches had nests and eggs at Waplington during June.

A pair of Stockdoves nested in the York Museum Gardens early in May.

Great Spotted Woodpeckers and Green Woodpeckers have been seen at Strensall.

Two small parties of Tree Sparrows were seen at Dunnington, and another party at Hazel Bush on March 13th, the bird being less common here than was the case a few years ago.

A Blackbird with pure White head spent the winter of 1932-33 between Thirsk and Kilburn, and was still there on May 28th.

Another freak was a young Sparrow killed by a cat at Huntington on June 28th, which had a well developed wing growing on its left leg.

Several pairs of Pied Flycatchers nested near Helmsley, and a Lesser Whitethroat's nest with five eggs was found there on May 26th.

### Arrival of Summer Visiting Birds.

| | |
|---|---|
| Willow Warbler ... | Hawnby, March 20th ; Bugthorpe, March 16th ; Strensall, March 12th ; Dringhouses, March 15th, numbers on April 1st. |
| Chiff Chaff ... ... | Huntington, April 6th. |
| Wheatear ... ... | Strensall, April 12th ; Middleham, April 23rd. |
| Sand Martin ... | Stamford Bridge, April 12th and April 17th ; Buttercrambe, April 20th. |
| Swallow ... ... | Pickering, April 12th ; Huntingdon, April 17th ; Naburn, April 17th ; Dringhouses, April 17th. |
| Sedge Warbler ... | Linton-on-Ouse, April 14th ; Huntington, April 21st. |
| Whitethroat ... | Linton-on-Ouse, April 14th ; Buttercrambe, April 20th ; Huntington, April 21st. |
| Sandpiper ... ... | Naburn, April 17th ; further parties May 11th. |
| Reed Bunting ... | Dringhouses, April 23rd. |
| Cuckoo... ... ... | Bishop Wilton, April 24th (2) ; Heworth, April 21st ; Keld Head, April 25th ; Stamford Bridge, April 25th ; Huntington, April 29th ; Haxby, May 1st ; Bugthorpe, April 21st ; Welburn. September 13th[1] ; others reported on this date from Stamford Bridge and Strensall. |
| Whinchat ... ... | Keld Head, April 25th ; Strensall, May 2nd. |
| Tree Pipit ... ... | Askham Bogs, April 26th ; Strensall, April 30th. |
| Turtle Dove ... | Skipwith, April 26th. |
| Swift ... ... ... | Skipwith, April 26th ; Huntington, May 3rd ; Huntington, numbers May 4th ; Dringhouses, May 5th ; York, May 8th ; last Swift seen at Huntington on August 11th. |

[1] Young birds of the year on outward migration.

| | | |
|---|---|---|
| Yellow Wagtail | ... | Haxby, April 28th. |
| Landrail | ... | Bugthorpe, May 2nd. |
| Nightjar | ... | Skipwith, May 8th. |
| Grasshopper Warbler | | Bishops Wood, May 13th. |
| Nightingale | ... | Farlington, May 30th ; Stillington, May 30th ; Waplington, June 11th, nest and four young ones. |

Winter Visiting Birds.

| | | |
|---|---|---|
| Fieldfare | ... | Huntington, a party arrived on September 24th. |
| Redwing | ... | Huntington, a flock arrived on October 6th. |

For valuable help in compiling these notes, I am indebted to Dr. J. S. Gaynor, Mr. V. G. F. Zimmermann, Mr. H. Shorney, Mr. F. Jefferson, Mr. Cecil H. Cobb and Mr. Arthur Smith.

## MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

**Mammals** (W. G. Bramley) :—The status of Red Squirrels does not appear to alter much, although a slight falling off is indicated in the Whitby area, but in the neighbourhood of Scarborough a slight increase is recorded. The Grey Squirrel continues to maintain its numbers, and is also slightly extending its radius. In this species also a decrease is noted in the Whitby area, and also in the York district. In the latter case this is due to human agency, the Squirrels being destroyed when opportunity occurs.

The smaller rodents, Mice and Voles, have been very scarce throughout the year, and very few have been seen either in the York or Scarborough districts.

Hares and Rabbits have had a good season, and are numerous throughout the county except parts of the North Riding where they have not yet recovered from the epidemic of the previous season.

The Black Rat continues to decrease about the harbour at Scarborough, but Brown Rats have increased in the same area, but no exact figures are available.

No decrease is reported in the numbers of Otters which are to be found in most of our rivers. Three adults were killed in the Derwent at Hackness on June 8th, 1933. Two young ones were caught on the banks of the River Don at Rawcliffe in the third week in October

Stoats are abundant in both Upper Airedale and Upper Wharfedale.

Two interesting records are reported from Scarborough. A Bottle-nosed Dolphin between 8 and 9 feet in length caught at Filey, July 6th, and a White-sided Dolphin taken near Scarborough on September 22nd, with a length of 5 feet. The first is new to the county, and only one other record is available for the latter. Probably both are more numerous in our waters than the number of specimens handled indicates.

A Porpoise which was following Salmon up the Ouse met an untimely end at Naburn on February 4th.

**Reptiles.**—In the North Riding, Vipers were seen at an earlier date than usual, four being observed on March 11th, while five more were seen assembled for breeding on March 21st.

A Grass Snake, 2 feet long, was captured in the streets of Hebden Bridge on October 10th. In Holderness, numbers have been noted in the stubbles which have very little bottom growth. This is probably due to the drying up of the ditches and ponds, but may be they are overlooked in normal years. This also applies to young frogs and toads.

Two examples of the Gecko (*T. mauritanica*) were found alive among foreign fruit at Scarborough on February 1st.

**Amphibians.**—Frogs and Toads have been numerous, but in some areas a certain mortality has been caused by the drying up of the breeding ponds.

**Fresh Water Fish.**—From reports received from Messrs. S. H. Smith and D. Langstaffe, Salmon have been plentiful in the Ouse and some of its tributaries, and about October 12th over 120 ascended the fish pass at Boroughbridge. On April 2nd, one of 6-8 lbs. was caught below the weir at Topcliffe and returned to the water. During July, Salmon parr were caught in Cundall Beck near Brafferton, which has its outlet just below Topcliffe Weir. On April 14th some thirty Salmon were waiting below the weir at Linton-on-Ouse for a suitable fresh to help them on their way upstream. Four were seen at Stamford Bridge on June 28th, one being estimated to weigh 20 lbs.

A Sturgeon was seen in the Ouse near Cawood on April 4th and eluded capture by Salmon fishers and finally disappeared up the River Wharfe.

In the waters of the York Amalgamation of Anglers, Minnows have become extremely numerous this year. The only stream in which they have not increased is at Hustwaithe, where Trout are abundant.

Lamprey were again seen in the Isle Beck on April 9th, and many hundreds were observed in the River Rye during July.

A pond belonging to Mr. Shafton at Shensall contains a tame Perch which frequents the boathouse, coming to be fed. It has free access to the pond.

Mr. Oliver released some Golden Orfe in a pool bordering his pond at Lower Newton. They all vanished, but later after flood one returned. This summer one was caught in the larger pond and placed with the returned prodigal, while two others were seen leading a shoal of Roach, another shoal of Roach being led by a single Golden Orfe.

Few fish of any outstanding size have been recorded. A Tench of 3 lb. 1 oz. was taken from the Pocklington Canal near Hagg Bridge, July 6th.

A good Pike for the Ouse was one of 16½ lbs. near Aldwark.

Barbel up to 9 lbs. have been obtained from the Swale.

A feature of the year has been the consistently good sport furnished by Roach in the Ouse from York to below Naburn.

I am indebted to Messrs. H. B. Booth, S. H. Smith, W. J. Clarke and C. F. Procter for information used in compiling this report.

**Marine Fishes** (W. J. Clarke) :—Red Gurnards, as usual, turned up at odd times, but never more than single specimens.

Saury Pike, or Skipper.—This uncommon Yorkshire fish occurred in number close inshore during January, 1933. Many were seen leaping, and specimens were captured at Burniston, Scarborough, Filey and Reighton, the first time this species has come under my notice.

Snake Pipefish.—A fine example, 21 in. long, was taken at Scarborough on February 28th, 1933.

Ling.—An unusually large example, measuring 5 ft. 5 in. in length was caught near Scarborough on April 11th.

Tunny.—These giant fish were very abundant in the waters off the Yorkshire coast during 1933. They were first noticed on May 5th, the earliest date for them yet recorded. Between August 3rd and September 12th, 102 were captured off Whitby, Scarborough and Filey, weighing from 313 lbs. up to 851 lbs.

Pelamid.—A ' very young tunny ' caught in the Salmon nets at Filey on August 31st appeared from the description given to me to be a Pelamid. Messrs. Cooper and Sons, the specialists in fish mounting, to whom it was sent for preservation, said it was a Pelamid.

Cod.—One weighing 2½ stones caught near Scarborough had in its stomach 107 egg capsules of some kind of Skate.

Rays Bream.—One of these rare fish was taken in the trawl net off Scarborough on September 9th.

Skate.—One landed at Scarborough on August 14th had an extra fin growing from the backbone just behind the head. The fin was about the size of a man's hand, and stood up vertically from the back.

Porbeagle Sharks were very abundant during the warm months, running up to 9½ feet in length.

Angel Shark, one 5 feet long, caught near Scarborough on March 14th.

## WILD BIRDS AND EGGS PROTECTION COMMITTEE.

**Thornton Dale** (C. F. Procter) :—Mr. J. Green reports that the Stone Curlew is being lost to us. Only two pairs turned up, and he thinks that neither successfully nested. Under the Re-Afforestation scheme, the nesting grounds are planted out and the bare spaces are continually disturbed by bracken mowers and tree planters. One of the Forestry Commissioners reported a pair near Troutsdale Head, on a patch of broken ground. It is possible that this pair may have nested. We cannot but regret that the Stone Curlew, in this, its most northerly breeding station, should have such poor luck, but we can only hope that what is our loss is others' gain.

The severe winter was disastrous to Bullfinches, Goldfinches, Gold Crested Wrens and Tree Creepers in the early part of the year. A pair of Nuthatches were reported from the Derwent bank, opposite some rough ground near Scampston.

**Hornsea Mere.**—Twenty Herons nested earlier than usual. We watched the Mere from May 13th to July 15th. There were then six Swans. There are now 45. Two pairs have reared six and seven Cygnets respectively. Twenty-three pairs of Great Crested Grebes reared clutches of two and three ; two pairs have been seen with four. The ducks have done well. Mallard, Teal, Shoveller, Shell Duck, Tufted and Pochard have been in considerable numbers. Snipe and Redshank nested at the Bull Ring. Several pairs of Green Plover have bred, and there have been a few Golden Plover staying on through the summer. Three pairs of Woodcock nested. Two reared young. There have not been many Cormorants.

Three Kingfishers bred. Reed Warblers, Blue Tits, Goldfinches, Yellow Hammers, Meadow Pipits and Tree Creepers were common. Wrens repeated their performance of last year by successfully rearing young in the bodies of two Carrion Crows on the same vermin pole. There were not many Cuckoos. Barn, Tawny and Little Owls appeared in their usual numbers. The Little Owl seems to have become stationary in numbers. The Bearded Tit has not been observed.

**Spurn.**—We started watching on May 13th. The Terns had just arrived. To August 6th, 14 Ringed Plovers' nests, each containing four eggs, were observed. The last to hatch off was on August 6th. The dates are later than usual, but the hatching was very successful.

Lesser Terns started nesting about May 28th. Up to June 4th, 30 nests were observed. To July 10th, a further 19 nests were found, most of which were laid up, although on June 11th there was one nest with only one egg in. No attempt to nest later than July 10th was observed. Forty-nine in all were found, containing 117 eggs. The Terns had a good season.

(*To be continued.*)

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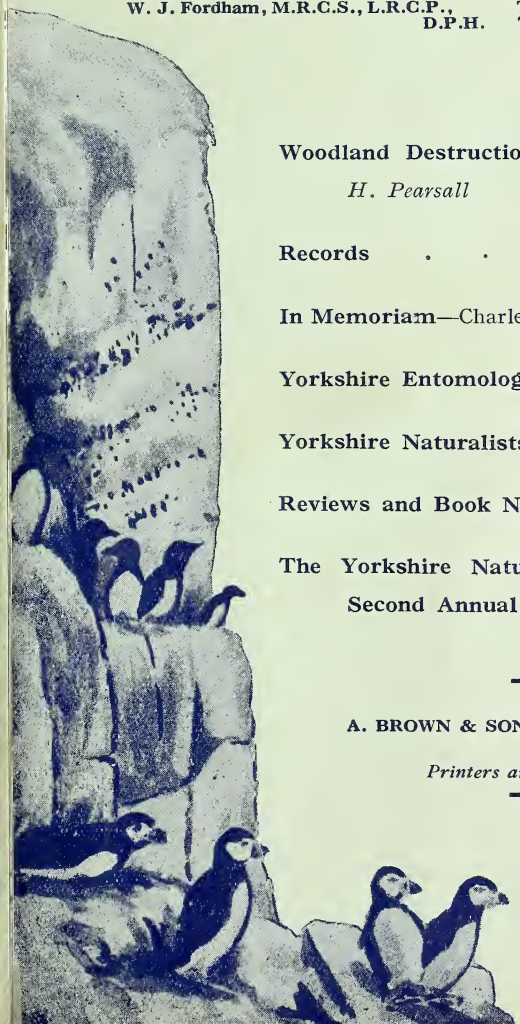

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*President of the Section*: Rosse Butterfield, Keighley.
Two meetings will be held in the Library of the Church Institute, Albion Street, Leeds, on Saturday, February 17th, 1934, at 3-15 p.m. and 6-30 p.m.

The following papers will be read:

'Seasonal Movements of Birds,' by Rosse Butterfield, F.E.S.
'Birds of the Estuary,' by C. F. Procter.
'Some Common Yorkshire Birds' (illustrated), by M. Longbottom.
'Wayside Whispers' (cinematograph film), by J. R. Edwards.

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# WOODLAND DESTRUCTION IN NORTHERN BRITAIN.

W. H. PEARSALL.

In a recent paper (Wilcox: *Woodlands and Marshlands of England*, Liverpool) dealing with the distribution of forests in England in prehistoric times, detailed reference is made to the factors favouring or retarding the destruction of forests in this country. While the work is that of a geographer and not of a professed ecologist, it is evident that the author has been at considerable pains to examine all the sources of evidence and the list of authorities cited is, in fact, comprehensive. It is, therefore, remarkable that there is no reference in this work to the importance of grazing as a factor in woodland destruction, and it must be assumed that there is no clear recognition of the importance of this factor in English papers dealing with forest destruction. On the other hand, perhaps the most important development of recent years in the field of woodland ecology has been the recognition of the extreme importance of animal grazing in preventing the regeneration of trees. The experiments of Watt (*Journ. Ecol.*, VII, 173) show that seedling development is practically impossible in a typical English woodland, and this is also the practical experience of all foresters and estate agents in Northern England with whom the question has been discussed. The general explanation advanced is that owing to the preservation of game, carnivorous birds and animals are so reduced in numbers that animals such as rabbits and particularly mice are abnormally abundant. This disturbance of the balance of nature results, as Watt showed, in the destruction of all unprotected tree seedlings, and hence accounts for the rarity of seedlings in most uncontrolled British woods. Without seedling regeneration the life of the woodland must be limited to that of the existing trees.

It is recognised that grasslands in this country represent a biotic plant community controlled by the grazing factor, and it is evident that quite intermittent grazing suffices to prevent the regeneration of woodland. It should also be remembered in this connection that recent work has proved that the composition of grasslands is decisively controlled by the amount and season of grazing, so much so that it appears that these grazing factors may have more effect on grassland composition than any known manurial treatment. It is legitimate to suppose, therefore, and supporting examples can readily be cited, that grazing can lead to rapid degeneration of woodland. Further, it is known that the heathy areas common on sandy soils (for example, in Cheshire, the New



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Forest, Staffordshire and Norfolk) have been produced from woodland in historic times. It is recognised that indiscriminate grazing has been a powerful factor in the degeneration of these woodlands, and that it may still, as in Breckland, exert a decisive influence on the composition of the present vegetation (Farrow, *Journ. Ecol.*, V, 1).

The writer's interest in this problem originated through the difficulty experienced in explaining the distribution of certain grassy types of woodland ground flora which are common in the North of England. In Southern Scotland and the Lake District, it was found that these grassy types covered a range of soil and aspect conditions normally occupied by herbaceous and mossy types of ground floras. A wider survey has shown that in all cases the grassy types of ground flora can be correlated both with evidence of definite grazing effects and also with a normal absence of tree seedlings. The grazing effects have been traced to rabbits and mice in some cases, more often to domestic animals, and particularly to sheep. The grassy types of ground flora appear to offer a whole series of communities ranging from normal woodland plants to a shade form of the *Agrostis Festuca* grassland of the Lake District hills. In many cases this series of ground floras runs parallel to very evident stages of woodland degeneration. Where sheep (and cattle) are excluded by fencing, extreme degeneration of the woodland is less common. The definite impression left by the study of these woodland types is, however, that grazing is the commonest cause of woodland degeneration at the present time, and that, in the hills, sheep are the chief agents in this degeneration.

In a recent book (Mackenzie, *Ancient Man in Britain*) there is a map summarising the stations at which monuments of prehistoric man are known in England and Wales. This map is of interest, not only because it shows that many of the stations are adjacent to easily worked minerals (*e.g.* jet in North East Yorkshire, haematite near Banbury), but also because it draws attention to the very great abundance of prehistoric dwellings and remains in the Lake District and North Wales. The author hints that these prehistoric peoples might have been engaged in collecting pearls from the rivers, or in mining copper. It must be confessed that at present copper mining among the hard rocks of these districts appears to be so arduous that it could have offered little scope to prehistoric man. Nor is the pearl mussel so widely distributed or so abundant as to commend itself as a means of support to what appears to have been a large prehistoric population. Moreover, the distribution of the abundant Lake District dwellings bears no relation to the present distribution of copper or of pearls. It is, on the other hand,

quite definitely oriented around the best sheep grazing grounds. It is equally noticeable that signs of prehistoric dwellings are, as a rule, most abundant at heights of above one thousand feet, and this is quite understandable when it is remembered that the valleys and the sides of the estuaries were often quite impassable marshes and peat bogs, even in recent historical time. The earliest historical clues point definitely to the hill tops having been bare of trees, and the lines of Roman roads are very suggestive both of this and of the possibility that a large proportion of the population lived on the hills. There seems to be a strong probability that this population lived on its flocks of sheep, and the location of the dwelling sites appears to give strong support to such an assumption. (Horned sheep appear to have come to Europe in the Cro-Magnon period, and there is some agreement that the horned hill breeds resemble the primitive West European stock.) It is evident that destruction of the woodlands was proceeding in prehistoric times, and we have to assume that this developed downwards from above. The destructive effects of sheep grazing are so great and so sure that we are bound to regard them as a principal agent in prehistoric woodland degeneration.

On similar grounds, this conception of woodland destruction would undoubtedly be applicable to many areas in North Wales and Southern Scotland. There are suggestions that similar causes may have operated in other parts of the North of England, such as the Ingleborough district and North-east Yorkshire. The place name evidence suggests, perhaps, that valley clearings were greatly extended with the coming of peoples of Scandinavian origin. The earlier and more primitive peoples would undoubtedly tend to follow lines of open country, and they would—if they did actively attempt to clear—attack the more open and scrubby woodlands first. Recognising the difficulty of woodland removal with inadequate tools, it seems far more probable that natural grazing effects were the first extensive agent of woodland destruction. The story by Kipling (in *Puck of Pook's Hill*) of prehistoric life on the South Downs seems to offer an adequate conception of the life of these peoples and of their attitude to the forests.

From a somewhat different point of view the destruction of woodlands would permit the more rapid leaching of the soil and the development of soil acidity. It would facilitate the subsequent development of moorland. It is no doubt a matter for discussion as to whether soil acidity ever develops *in a woodland* to a sufficient degree to prevent woodland regeneration. On waterlogged soils, however, tree regeneration may cease if one may judge from the peat bog evidence. But in even the most acid woodlands in the North of England

one can find, *if grazing effects are slight or absent*, growing seedlings of all the characteristic trees. This evidence suggests that soil acidity alone does not prevent woodland regeneration in this region, though possibly it may tend to make this regeneration more difficult. It may be admitted that this conclusion represents a complete reversal of the writer's original point of view. It will be evident also that the writer is inclining to the view that the disappearance of woodlands in Northern Britain is primarily due to grazing, the development of moorland plant communities, if and when it occurs, being a subsequent process. This hypothesis alone provides an adequate explanation of the facts observed in North Lancashire, the Lake District, and Southern Scotland. It must be left to others to say whether it is equally applicable to such areas as the Southern Pennines and North-east Yorkshire.

The still more general point of view which emerges from this discussion is that the hilly regions of Northern Britain can be regarded as a tension zone between woodland, grassland, and moorland, in which the extension of grassland, and, subsequently, of moorland, has progressed mainly through the biotic factor of animal grazing. It appears possible to draw a broad general parallel between this condition and that of the forest prairie tension zone in the eastern prairies of North America, where woodland growth is possible, and, climatically, to be expected, but where, in the natural state, extensive grasslands were maintained by the operation of a grazing factor, the presence of bison and of other herbivorous animals.

## RECORDS.

A VERY fine specimen of the bittern was shot near the Humber side recently. The bittern has responded very readily to the earnest efforts of protection which have been made on its behalf in Norfolk, where it now breeds again, although sparingly, and it is unfortunate that this most beautiful rare bird should be killed as a penalty for visiting Yorkshire. This is the second instance that has come under my notice during this last year of the bittern appearing in the neighbourhood of the Humber.—C.F.P.

A WHITE mole has been brought into the Hull Museum from Winestead. It was caught alive on Monday afternoon, December 11th, 1933, but it died very soon, probably from hunger rather than from cold. A mole cannot go more than about a couple of hours without a meal, and is probably unique amongst our fauna in that respect. A white mole is by no means rare, but it is no less interesting.—C.F.P.

# In Memoriam.

## CHARLES MOSLEY, M.B.O.U. (1875-1933).

By the death of Mr. Charles Mosley on the 11th December, 1933, both his native town (Huddersfield), and Wakefield, where he was Curator of the Museum and Art Gallery, have suffered a distinct loss. He was born at Forest Road, Huddersfield, on the 27th December, 1875, and after receiving his education at local schools he became apprenticed to a printer at Liverpool. From his birth he was cradled in the study of nature, for his father was the celebrated economic naturalist, Mr. Seth Lister Mosley, and it was therefore quite natural that he should devote the greater part of his spare time in the study of natural objects. His chief studies found development in the science of Ornithology and mammals. In this respect he became a member of the British Ornithologists' Union, and the Yorkshire Naturalists' Union. He was a constant attendant at the meetings of the Vertebrate Section of the Union. He had, however, a great love for all things natural, and was quite a keen student in the field. The writer has had his unbroken friendship for forty years, and until the time of Mr. Mosley's marriage we were inseparable in our field work, not only locally, but in other parts of the British Isles, and the writer's memory readily recalls the untold happiness which each received when culling direct from nature's vast field. He was no mean entomologist, especially in Lepidoptera, his captures, quite naturally, being merged in the collection made by his father. He gave some study to the Arachnida, and his collection was presented by him to the Tolson Memorial Museum at Huddersfield. During the early part of his working life he was responsible for most of the printing required by his father, this including the publication of the *Naturalists' Journal* and *Nature Study*. After marriage, for twenty years he carried on the business of a letter-press printer and stationer at Lockwood, but never at any time ceased his natural history studies. In 1920 he was appointed Assistant Curator of the Tolson Memorial Museum, and on the retirement of his father from the position of Curator in 1925 he succeeded him as Chief Curator. During the time he and his father were in joint office they rendered excellent service in consolidating the Museum from its foundation, one of the outstanding phases of their work as well as a lasting memorial thereof, being the magnificent bird room at the Museum. During the whole time of his employment at this Museum, Mr. Mosley was responsible for the keeping of the meteorological records for

Huddersfield, and took a deep interest in that part of his work. In 1930 he accepted the curatorship of the Wakefield Museum and Art Gallery, and at once threw his energies into reconstructing this Museum on modern lines. Here he worked under a Committee who thoroughly sympathised and helped in all possible ways in the required advancement of the Museum, and it is unfortunate that Mr. Mosley was not permitted to see carried to fruition the plans put forward by him for the advancement of the Wakefield Museum. Although he never considered himself a botanist in the strict sense of the word, he had a passionate love for wild flowers and had quite a good knowledge of his local flora. The study of the Oak had a fascination for him, and this study resulted in the publication by him in November, 1910, of a book on *The Oak, its natural history, antiquity and folklore.* He also published in 1905 a popular edition of *White's Natural History of Selborne,* rearranged and classified under subjects. His literary labours also found expression in his weekly articles in the natural history column of the *Yorkshire Weekly Post,* and monthly in the *Huddersfield Borough Advertiser.* He also contributed for two years meteorological notes for the County in *The Naturalist,* in which journal, as well as other magazines devoted to science, he contributed field notes. He was also the author of many pleasing poems. In connection with his membership of the New North Road Baptist Church, Huddersfield, he held the position of publicity secretary and editor of the Church Magazine. Mr. Mosley was an excellent amateur photographer and maker of lantern slides, which arts he aptly used in illustrating his field notes, for record purposes, and his varied lectures. He also exhibited at many Photographic exhibitions. Like all true naturalists he was ever glad to place his knowledge at the disposal of natural history and literary societies, and in consequence his services were in much demand throughout the County. He was a member of the Huddersfield Naturalist, Photographic, and Antiquarian Society from 1889 to 1930, and for twenty years he acted as honorary secretary of the natural history section of such society. Mr. Mosley was also keenly interested in music, and during his residence at Huddersfield gave service to local musical societies, both as instrumentalist and vocalist. As an energetic worker in the cause of temperance he was widely known. He was a Vice-President of the Huddersfield Temperance Society, and held many offices in the International Order of Good Templars. He married in 1901 Miss Lucy Shaw, the younger daughter of the late Mr. George Shaw, of Springwood House, Huddersfield, who survives him, and he has also three daughters surviving. —W.E.L.W.

## YORKSHIRE ENTOMOLOGISTS AT LEEDS.

W. D. HINCKS, M.P.S., F.R.E.S.

A feature of the annual meeting of the Entomological and Plant Galls Sections of the Yorkshire Naturalists' Union held at Leeds on October 21st, 1933, was the numerous and interesting series of exhibits which occupied the afternoon session. The short afternoon was, indeed, quite inadequate to do justice to the wealth of material brought by members and visitors. Mr. Cheetham described the life history and habits of the Yorkshire Cylindrotominae, showing specimens of the adults. Mr. W. P. Winter contributed the workings and adults of a wood-boring bee, specimens illustrating the stages of the Colorado beetle, and suggested a useful method of preserving galls, showing specimens which had been treated by this method and had remained in good condition over a considerable period. A series of very interesting galls sent by Mr. Burkill were exhibited by the secretary and were discussed by Mr. W. P. Winter and others. Mr. Hyde had a fine drawer of picked specimens of *Chrysophanus phloeas*, many of which were bred specimens and showed considerable variation. Yorkshire and Durham Coleoptera and Hemiptera formed the subject of Mr. Thompson's exhibit, and his box included some interesting species. Mr. Dibb showed a number of Ephemeroptera nymphs and adults, and a series of largely Yorkshire caught Tanypodinae together with other Diptera and some interesting Coleoptera. Mr. Hincks had living examples of *Chrysomela graminis* from York fed originally on Tansy and later on garden mint, also some striking exotic Coleoptera and a box of several orders collected in the county during the season. The President, Mr. Brown, described a box of Neuroptera and Hemiptera from various Yorkshire localities. A specimen of *Vanessa io* captured in Leeds was exhibited by Mr. Bengry, and some boxes of Keighley district specimens brought for distribution by Mr. J. Wood were passed round and discussed by Mr. Brown.

The evening meeting, after the business had been transacted and recorders reports considered, was taken up by two papers. In ' Some Points in the Anatomy of the Psocoptera,' Mr. Brown, illustrating his remarks by enlarged drawings, discussed the little understood characteristics exhibited by the mouth parts of Psocids, and in a clear manner explained several of the unusual features presented by their wing venation. Mr. Hincks dealt briefly with the general classification of the vast family Curculionidae, and pointed out several anomalies in the system of classification adopted by students of the British species of the family, illustrated by boxes of specimens.

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## YORKSHIRE NATURALISTS AT LEEDS.

CHRIS. A. CHEETHAM.

The Seventy-second Annual Meeting of the Union was held at The University, Leeds, on December 9th, 1933, by the courtesy of the Council of the University.

The General Committee of the Union met in the afternoon and considered the Annual Report and Financial Statement ; although a considerable number of new members of the Union were announced, the losses by death and resignation have reduced the membership heavily and this matter will require serious attention. Some of the oldest members of the Union were present and spoke on this subject and on the new phase of the Union's journal, amongst the speakers being Messrs. Bayford, Bevan, and Thompson.

In the evening the President, Mr. J. Meikle Brown, F.L.S., F.R.E.S., gave his presidential address on ' The Animal Biology of Upland

Streams ' taking the members by means of lantern views to a wide variety of mountain streams and showing the wide differences of their fauna due to varying conditions found there.

Later in the evening the members were entertained at a conversazione by the invitation of the Leeds Co-operative Naturalists' Field Club, the Leeds Geological Association, the Leeds Naturalists' Club and Scientific Association, and the Yorkshire Conchological Society, who, with the help of Professor J. H. Priestley and Professor E. A. Spaul, had arranged a most interesting set of exhibits in the rooms of the Botany and Zoology Departments of the University and here light refreshments were kindly provided.

It was announced that Mr. F. A. Mason, F.R.M.S., had resigned the Secretaryship of the Union which he has held for the last thirteen years ; this was received with much regret and he was thanked for his long and valued services. Mr. F. A. Mason was then elected President of the Union for 1934 with much applause from the very large number of members present.

Mr. S. D. Persy Fisher was re-elected Treasurer and Mr. Chris. A. Cheetham elected Secretary.

The editorship of *The Naturalist* being retained by Dr. W. H. Pearsall, F.L.S., and Mr. W. R. Grist, B.Sc., at The University. Leeds.

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## REVIEWS AND BOOK NOTICES.

**Laboratory Directions in General Zoology, by W. C. Curtis, Mary J. Guthrie, and F. H. Woods.** With 60 diagrams, 1-164 pp., size $5\frac{1}{2} \times 9$ inches, revised second edition, published in 1933 by John Wiley and Sons, Inc., New York, and Chapman and Hall, Ltd., London. This book is full of useful hints and methods for the dissection and practical manipulation of the frog and many invertebrates. The latter include Amoeba, Euglena, Paramoecium, Granlia, Hydra, Planarians, Liver Fluke, Tape Worm, Ascaris, Earthworm, Anodonta, Asterias, Crayfish and Locust.—H.H.

**Textbook of General Zoology, by W. C. Curtis, Mary J. Guthrie, and F. H. Woods.** With 438 text-figures, 1-588 pp., size $5\frac{1}{2} \times 9$ inches, revised and reset, second edition, published in 1933 by John Wiley and Sons, Inc., New York, and Chapman and Hall, Ltd., London. A good general text-book apparently correlated for use with the laboratory manual noticed above. The first part deals with such general topics as physiology, endocrine, co-ordination, cytology, reproduction and heredity. Then follows descriptions of representatives of the various invertebrate phyla and finally about 60 pages devoted to a study of principles of evolution. Apart from their physiology the vertebrates are very little touched upon.—H.H.

**An Introduction to Zoology, by Z. P. Metcalf.** With 84 text-figures, 1-425 pp., size $6\frac{1}{2} \times 9\frac{1}{2}$ inches, published in 1932 by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London, W.C.2. This book concerns itself mainly with the teaching of zoology through a very detailed study of the rat. It contains a wealth of information on the physiology and anatomy of mammals. The rest of the book is perfectly general and deals with animal distribution, palæontology, evolution and the history of zoology. No other types are studied and the book is obviously chiefly intended for the use of first-year students who are little likely to proceed further with the subject. It exemplifies one of the methods of teaching general zoological principles at present in vogue in America.—H.H.

**An Introduction to Biology,** by **E. C. Cole.** With 291 text-figures and 1-518 pp., size 5×8 inches, published in 1933 by John Wiley and Sons, Inc., New York, and Chapman and Hall, Ltd., London. A book that may be called ' A study of the biology of the out-of-doors.' Refreshingly strange in its method of treatment but quite unadaptable for use in connection with any zoological syllabus in use in English schools and universities. For its insistence upon the study of function and relation to environment it is well worth reading by the first-year student. It does not deal with types.—H.H.

**Letters and Diaries of A. F. R. Wollaston,** selected and edited by **Mary Wollaston,** with a preface by **Sir Henry Newbolt,** pp. XVI+ 261, Cambridge University Press, price 12/6 net. A. F. R. Wollaston whose untimely and tragic death occurred in June, 1930, was a born naturalist, and this very well-arranged series of letters and diaries should prove of much interest to all nature lovers. It would be of interest to know what percentage of educated people record the main events of their lives in a permanent form. Probably most of those who keep a diary do so for their own amusement, but it very often happens, as in this case, that the record becomes of definite value to others. This book is more than a portrayal of the life and character of a charming and cultured man. It contains valuable nature and travel notes made by a keen and careful observer who spent much time abroad, particularly in Central Africa and the East Indies.

**Charles Darwin's Diary of the Voyage of H.M.S. " Beagle,"** edited from the MS by **Nora Barlow,** pp. XXX+451, Cambridge University Press, price 12/6 net. All naturalists are interested in Charles Darwin and will be grateful to his grand-daughter, Mrs. Nora Barlow, for the publication of this personal and private record of his famous *Beagle* voyage. Darwin wrote up rough notes every day, and when he had more leisure expanded these into a more readable form. The diary undoubtedly formed the basis for his classical " Voyage of H.M.S. *Beagle,*" but all the same it has a special value of its own. The editing has been extremely well done, but one feels a little puzzled to find that Darwin's very erratic and inconsistent spelling has been retained.

**Darwin,** by **W. G. Hingston** (Great Lives series), pp. 144, Gerald Duckworth and Co., Ltd., price 2/- net. This is an excellent short account of the life and work of Charles Darwin. In less than 150 pages the author gives all the details necessary for most readers, and is particularly good when dealing with Darwin's work on the ' Origin of Species.' The book begins with a useful chronology, and ends with a bibliography to which might well be added the title of the volume reviewed above.

**The Next Ten Years,** pp. 58, Methuen and Co., 1/- net. This is one of the well-known *Spectator* booklets in which authorities such as the Master of Sempill, St. John Ervine, and Professor Langdon-Brown treat of future of aviation, the press, and medicine. Of particular interest to readers of this journal are some of the other articles. Professor J. B. S. Haldane suggests that in the immediate future biology will concern itself particularly with enquiry into the ultra-microscopic, such as is now being attempted by X-ray analysis of structure, and by researches into virus diseases. Genetics and animal population studies also seem to him to offer prospects of rapid advance. Professor Patrick Abercrombie thinks that regional planning on a national scale will be the development of the immediate future in our national life. Lord Conway believes that exploration is beginning a new phase, in

which intensive study of limited areas by specialists will replace the journeys by isolated travellers which have been customary. Captain Liddell Hart has a most acute and encouraging vision of the future of warfare. The whole forms a collection which certainly should be read.

**The Geology of the South Wales Coalfield,** Part V (xix+283 pp., plates and figures, 5/6. The first edition of this memoir was published in 1904 and has been out of print for many years. The progress of mining and scientific research has made necessary a considerable amount of revision, but the general plan of the memoir has not been materially altered. The memoir is of far more general interest than its title indicates.

**British Freshwater Copepoda,** by **Robert Gurney.** Ray Society, Vol. III ; Dulau & Co., Ltd., 37/6 net. Among the more precious volumes which mingle in my little collection of works on natural history is a happily increasing set of publications by the Ray Society. A friend, compassionating the needs of an impecunious parson, sends me, from time to time, a volume issued by the Society—to my infinite delight and to my exceeding profit. And now the Editors of *The Naturalist* follow in the same line with the gift of this splendid volume by Dr. Gurney, the third—and last—of the letterpress dealing with the Copepoda. The Society, over fifty years ago, issued G. Stewardson Brady's monograph on the copepods, which followed up the work of Baird on the British Entomostraca, published in 1850. But since Brady much work has been done, specially by Schmeil and Kiefer, and much work remains to be done, so that from time to time revisions will have to be made. It may safely be said that Dr. Gurney's work will be for English readers the standard for reference for many years to come. In this third volume he deals with the *Cyclopoida* and the *Caligoida,* completing his handling of the genera. There is an adequate bibliography eloquent of the labour, mainly German, expended on the copepods. The text is illustrated by beautifully clear and informative line drawings —in the three volumes they number over two thousand—descriptive of form and anatomy. It is refreshing to note Dr. Gurney's comments on systematic work. He protests—as does the most humble amateur in the field—against the ' excessive splitting of genera and species ' by differences that are trivial and vexatious. In his dealing with *Cyclops* he emphasizes aspects of unity. But one has only to contemplate the tremendous amount of detail that Dr. Gurney gives, to understand that his preference is not conditioned by any love of the easier way. For the volume under notice there can be nothing but praise.—W.L.S.

**The Atlantean Continent : Its Bearing on the Great Ice Age and the Distribution of Species,** by **H. E. Forrest, F.L.S.** Witherby, 10/6, 328 pp. The author has now given in extended form his theory of the Ice Age which he announced some few years ago. It is difficult to suggest any reason why a geologist should read this volume unless for amusement. Successive generations of glacial geologists since Louis Agassiz have been pursuing a will-of-the-wisp according to Mr. Forrest, who endeavours to show that the events of the Glacial Period are principally due to a great ice-sheet moving from the Atlantean Alps—a high range of mountains extending across the area of the North Atlantic Ocean and attaining a height of 16,000 feet in the position now occupied by Iceland. The theory is supported by a very careful selection of the details given by previous observers, a definite denial of others, misreading or misquotation in others, and a complete neglect of a very large body of evidence bearing on the Pliocene and Pleistocene history of N.W. Europe. That the Bermudas consist of 12,000 feet of coral rock, or that Kettleholes are formed by waterfalls over the edge of the ice-sheet, perhaps 1,700 feet high, are statements typical of the book. The author is, however, careful to point out in the second line of his preface that he is not a geologist.—H.C.V.

# YORKSHIRE NATURALISTS' UNION'S SEVENTY-SECOND ANNUAL REPORT FOR 1933.

(*Continued from page* 24.)

## Wild Birds and Eggs Protection Committee—*Continued.*

The erection of breakwaters has led to the growth of gravel deposits on the seaward side. The pebble zone is now out of the reach of any but abnormal tides, and has completely submerged the breakwaters in places. In spite of this, there is no notable increase in the colony. This is interesting. Not many years ago, the washing away of the nests was almost an annual event at the time of the summer solstice, and yet the number of nesting birds remains practically normal.

Oyster Catchers have been on the peninsular throughout the summer, but no nests have been found.

### List of Subscriptions for 1933*

| | £ | s. | d. | | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| A. Hirst ... ... | 5 | 0 | 0 | W. G. Birch ... ... | 0 | 10 | 0 |
| Major J. W. Dent ... | 2 | 0 | 0 | S. H. Smith ... ... | 0 | 10 | 0 |
| T. Waddington ... | 1 | 1 | 0 | Miss C. Edmondson ... | 0 | 10 | 0 |
| J. Atkinson ... ... | 1 | 1 | 0 | Mrs. J. S. Binns ... | 0 | 10 | 0 |
| York and District Field Naturalists' Society | 1 | 0 | 0 | Mrs. J. F. Ewing ... | 0 | 10 | 0 |
| | | | | J. J. Brigg ... ... | 0 | 10 | 0 |
| A. E. Boycott ... ... | 1 | 0 | 0 | W. F. Fearnley ... | 0 | 5 | 0 |
| H. J. Wilkinson ... | 1 | 0 | 0 | R. Butterfield ... ... | 0 | 5 | 0 |
| W. Macmillan ... ... | 1 | 0 | 0 | T. N. Roberts ... ... | 0 | 5 | 0 |
| F. H. Edmondson ... | 1 | 0 | 0 | J. R. Simpson ... ... | 0 | 5 | 0 |
| Miss Waterhouse ... | 1 | 0 | 0 | Mrs. G. Fysher ... | 0 | 5 | 0 |
| R. H. Edmondson ... | 1 | 0 | 0 | Scarborough Field Nat. Society ... ... | 0 | 5 | 0 |
| H. B. Booth ... ... | 1 | 0 | 0 | | | | |
| C. W. Mason ... ... | 0 | 10 | 6 | J. H. Rowntree ... | 0 | 5 | 0 |
| E. W. Taylor ... ... | 0 | 10 | 6 | G. Battie Bisat ... | 0 | 5 | 0 |
| E. B. Gibson ... ... | 0 | 10 | 6 | A. Wood ... ... | 0 | 2 | 6 |
| S. E. Evans ... ... | 0 | 10 | 6 | Miss Moorhouse ... | 0 | 2 | 6 |
| H. J. Behrens ... ... | 0 | 10 | 6 | W. Waterhouse ... | 0 | 2 | 6 |
| R. Chislett ... ... | 0 | 10 | 6 | Mrs. Wood ... ... | 0 | 2 | 6 |
| C. F. Procter ... ... | 0 | 10 | 6 | E. Hallowell ... ... | 0 | 2 | 0 |
| W. G. Bramley ... | 0 | 10 | 0 | W. L. Schroeder ... | 0 | 0 | 6 |
| W. Bennett ... ... | 0 | 10 | 0 | | | | |
| M. Forrest ... ... | 0 | 10 | 0 | | £28 | 8 | 0 |
| W. J. Clarke ... ... | 0 | 10 | 0 | | | | |

### Balance Sheet for 1933

| Income. | £ | s. | d. | Expenditure. | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Subscriptions as per list | 28 | 8 | 0 | Watchers— | | | |
| Balance from last year | 19 | 18 | 6 | J. Medcalfe, including Ins. ... ... | 14 | 5 | 0 |
| | | | | J. Clubley ... ... | 6 | 15 | 0 |
| | | | | J. Green ... ... | 3 | 0 | 0 |
| | | | | N. Pateman ... ... | 0 | 10 | 0 |
| | | | | Printing and Stationery (J. Young & Sons)... | 1 | 10 | 3 |
| | | | | Postages and registered Envelopes ... ... | 2 | 1 | 9 |
| | | | | | £28 | 2 | 0 |
| | | | | Balance in hand ... | 20 | 4 | 6 |
| | £48 | 6 | 6 | | £48 | 6 | 6 |

* Received since the Audit :—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T. Stainforth ... ... | 0 | 5 | 0 | V.G. F. Zimmerman ... | 0 | 10 | 0 |

## ENTOMOLOGICAL SECTION.

**Hemiptera** (J. M. Brown) :—Hemiptera seem to have been considerably more plentiful during 1933 than for several seasons recently, and a good number of species have been obtained on the different Union Excursions, some of these being less common ones. Among a small collection received from Mr. M. L. Thompson, were species provisionally identified as *Conostethus salinus* Sahl. and *Trioza abdominalis* Flor. from Greatham, both excellent records if confirmed. Others in the same lot were *Deltocephalus pascuellus* Fall. and *Plagiognathus albipennis* Fall. from the same locality, *Temnostethus pusillus* H. S. from Kildale, *Macrotylus paykulli* Mey. from Saltburn, and *Glenocorixa carinata* Sahl. from Widdale Fell. Among some received from Mr. Dibb, *Macropsis virescens* Fab. was the best, and Mr. W. P. Winter sent *Harpocera thoracica* Fall. from Shipley.

Among those taken by the recorder on the Excursions and reported in *The Naturalist*, the following are worth noting :—*Elasmucha grisea* L., *Gastrodes ferrugineus* L., from Skipwith ; *Pycnopterna striata* L., *Salocoris ochromelas* Gmel., *Cyllocoris flavonotatus* Boh, *Harpocera thoracica* Fall., *Microphysa pselaphiformis* Curt., and *Micronecta minutissima* L., from Dent ; *Stenotus binotatus* F., *Dichrooscytus rufipennis* Fall., *Cicadella viridis* L., *Euacanthus acuminatus* Fab., *Limoteltix nigricornis* Sahl., and *Empoasca butleri* Edw., from Ripon, *Deltocephalus socialis* Flor., from Goredale ; and *Psylla melanonura* Forst., from Robin Hood's Bay.

**Neuroptera** (J. M. Brown) :—Among the Lacewing-flies taken on the Excursions of the Union the best were obtained in the Ripon district, and included *Chrysopa vittata* Waes., *Hemerobius lutescens* Fabr., *H. marginalis* Steph., *M. simulans* Walk., and *Boriomyia nervosa* Fabr. At Dent the Mealy-winged flies *Conwentzia psociformis* Curt. and *Coniopteryx tineiformis* Curt. were fairly numerous, where also occurred the Alder-fly, *Sialis fuliginosus* Pict. and the Scorpion-flies, *Panorpa communis* L. and *P. germanica* L.

**Psocoptera** (J. M. Brown) :—These insects were fairly numerous during August, and the following were the best taken, *Psocus nebulosus* Steph., *Reuterella helvimacula* End., *Peripsocus phaeopterus* Steph., *Philotarsus flaviceps* Steph., and *Bertkauia lucifuga* Ramb. in the Ripon district, and the last also in Goredale.

**Plecoptera** (J. M. Brown) :—A considerable amount of collecting has been done of recent years among the Stoneflies, and our knowledge of their distribution in Yorkshire is extending. Mr. W. E. Bainbridge sends in the following good records. From the Ribble at Wheatley, *Capnia nigra* Pict., *Tæniopteryx nebulosa* L., *Nemoura avicularis* Mort., and from the Wharfe at Hebden, *Leuctra geniculata* Steph., *L. moselyi* Mort., *Amphinemura cinerea* Oliv., *Nemoura cambrica* Mort., *N. variegata* Oliv. and *Nemurella inconspicua* Pict. Mr. W. D. Hincks reports *Capnia nigra* Pict. from the Wharfe at Harewood Bridge and Scarcroft, and the following have been taken by the recorder at the Union Excursions. *Perlodes mortoni* Klap., at Falling Foss, *Perla carlukiana* Klp. at Dent, *Taeniopteryx risi* Mort. in Fylingdales, and at Dent, *Capnia vidua* Klp. in Howdale Beck, Robin Hood's Bay, *Amphinemura cinerea* Oliv., at Ripon, *Nemoura cambrica* Mort. at Robin Hood's Bay, *N. avicularis* Mort. at Dent and *Leuctra geniculata* Steph. at Ripon.

**Collembola** (J. M. Brown) :—The most interesting record for the season is that of *Orchesella litoralis* Brown, from Robin Hood's Bay.

**Diptera** (C. A. Cheetham) :—When reviewing the year to write a report on the diptera one can only see that the season promised great things and that these times never came ; from a diptera standpoint the year was a disappointment. The showy Syrphids were never to be

seen in any quantity, even the gall makers were oft times missing, those great clouds of midges which in some years have caught the eyes of many people were not to be found. Then, coming to one's own particular interesting species, these were seldom found in their normal numbers.

For the last few years I have been watching the connection between the flowers of the Grass of Parnassus and a small Limnobid. These were there in quantity, three or four on a flower I saw last year, and this year failed to see a single specimen, the same thing happened with several species which I have been used to finding in definite places. A few interesting things have been caught and the list of captures at Dent on the Whitsuntide Excursion was one of the best. Amongst the additions to our list the Limnobid *Triogma trisulca* Schum. is the most interesting. On working up other material of this group I find I have taken the remaining species missing from our list, *Liogma glabrata* Mg., near Ingleton, so that we have the whole four genera of the Cylindrotominæ in the district. The Triogma was found at the same place as *Tipula vafra* Riedel recorded on page 98, this latter is one of the species for which I have hunted in vain this year.

**Ephemeroptera** (John R. Dibb) :—May-flies have not been as abundant during 1933 as in the past few years, probably being rather seriously affected by the prolonged drought during the summer months.

I am indebted to our President, Mr. J. M. Brown, for a list of County records in addition to those species which he reported as occurring at Robin Hood's Bay in April and at Dent in June which appeared in *The Naturalist*.

The report upon the Ephemeroptera taken at Ripon in August at the Union Meeting is yet to appear and this will include *Ephemerella notata* and *Habrophlebia fusca* which are apparently local insects in Yorkshire. *E. notata* occurred in numbers. Several records of *Centroptilum luteolum* in large quantities from May to August have been made.

Perhaps the most interesting species this year is the appearance of *Eurycaenis harrisella* at East Keswick on 1st July, when two females and one male were taken. This is the first record I have received of living specimens in the County, the only other record being taken from dead specimens found by Mr. Hincks at Boroughbridge in August, 1931.

It will be remembered at our last Annual Meeting Mr. Wood handed to me a collection of May-flies he made last year and this contained a female specimen of *Ephemera vulgata* taken at the Canal, Keighley, on 1st July, 1932. This is an important capture confirming the only previous record of the species in Yorkshire made by Messrs. Percival and Whitehead in June, 1930, when *E. vulgata* was found by them near the Canal, West of Skipton.

Further investigations have been made with regard to the Nymphs and some six species in the nymphal state were taken from the River Skell in August and are at present undergoing examination.

Altogether I have received records of 15 species as against 17 last year out of 29 species known to have occurred in Yorkshire.

**Coleoptera** (M. L. Thompson) :—Members of the Coleoptera Committee attended the Meetings of the Union at Robin Hood's Bay, Skipwith, Dent, Ripponden, and Ripon, when a good deal of entomological work was done. From the reports which have reached me, it appears that beetles have been quite scarce during the past season, although the weather conditions seemed so favourable for their development. Nevertheless, some interesting specimens have been met with, of which the following may be mentioned. Mr. E. G. Bayford has met with *Podabrus alpinus* Pk., in Wheatley Wood, and *Chinocara undulata* Kr. at Birthwaite ; whilst *Pissodes notatus* F. was brought to him, having been found at Barnsley, and doubtless imported into the town with pit props from a local colliery. Mr. J. R. Dibb reports having found *Stenus guttula*

Mull. at Scarcroft, near Leeds, *Rhizophagus nitidulus* F. at Blackmoor, near Leeds, and *Chrysomela orichalcea* Mull. at Shadwell, near Leeds. I took *Bembidion* and *redtenbacheri* K. Dan. near Hawes, *Heterostomus pulicarius* L. commonly on the toadflax at Eston, *Epuræa florea* Er. at Wynch Bridge, Upper Teasdale, on the Mountain Ash, *Pullus testaceus* Mots. at Eston in Cleveland, *Cryptophagus umbratas* Er. in a Stockdove's nest at Ormesby, near Middlesbrough, and *Malthinus frontalis* Marsh at Kildale-in-Cleveland.

**Hymenoptera Aculeata** (Rosse Butterfield) :—A few of the spring bees, especially *Andrena Copponica* Zett. and *A. fulva*, occurred plentifully in some sandy localities, and the bilberry bloom proved attractive to other species of *Andrena*. Aculeata Hymenoptera have not been abundant in spite of the sunny summer. But what could be expected? In the West Riding the Aculeatas have fared badly for several years. Species of *Odynerus*, whose mud nests are visible on walls, rocks, etc., were last reduced to a small number. But this season has been favourable for the rearing of larvæ and doubtless the result will be evident next year.

In June, Mr. J. Wood observed in Holme House, Keighley, *Arpactus mystaceus* provisioning its young with 'cuckoo-spit' larvæ. Though *mystaceus* is well distributed, it is uncommon in the West Riding. *Crabo dimidiatus* was not uncommon in Upper Wharfedale, and *Crabro cribrarius* and *C. anxious* were in evidence in Upper Airedale. In less apparently favourable years social wasps have been more numerous. Nests were occupied much later than during the dry summer of 1921. Social bees have not been numerous in some parts. This can be accounted for only on the assumption that comparatively few queens survived in spring to found new colonies.

**Lepidoptera** (W. D. Hincks) :—The past season has been an especially favourable one for many of the *Lepidoptera* particularly for the migrant forms, the appearance of which has caused much interest both among Entomologists and in the press. Mr. Butterfield writes that he cannot recollect *Pyrameis cardui* and *Vanessa atalanta* appearing in greater numbers in any previous year this century, in the Keighley district. The experiences of other observers have been the same, thus, Mr. G. E. Hyde reports that both species in evidence in the Doncaster district and appearing earlier than usual. It would appear that the spring migrant *P. cardui* first reported in Surrey on March 12th, have been confined almost entirely to the hill tops and the first noted examples in the Leeds district was seen by the writer on May 23rd. The summer brood which has been quite numerous in several localities frequented the valleys in company with other Vanessids.

The first record of *V. atalanta* known to the writer is reported by Dr. W. J. Fordham who writes that Mr. W. Whitehouse observed an example on March 27th at Barmby Moor.

Mr. F. A. Mason has reported the occurrence of freshly-emerged *V. urticæ* in hibernative quarters early in August. An immigration in the south of *Colias croceus* has been noted and it is therefore pleasing to be able to record its definite occurrence in Yorkshire. Mr. C. W. Wright reports it from Ferriby in *The Naturalist*, p. 237.

A specimen of *V. io* was taken by Mr. Bengry in the Canal Gardens, Leeds, on August 30th off *Buddleia*.

Continuing his report from the Keighley district, Mr. Butterfield records the abundance of the three 'Whites' and the absence of *V. io* and *C. croceus* and reports in Grass Woods, in August, a large Fritillary, probably *Argynnis aglara* which he was unable to get near enough to to positively identify. Under similar circumstances a specimen was seen a few days later. Mr. Butterfield found *C. astrarche* abundant

in Upper Wharfedale but is unable to record the reappearance of *E. æthiops*, a former rarity of Grass Wood.

Early spring moths were scarce in South Yorkshire in spite of the fine, warm weather in March, reports Mr. Hyde, and Mr. Butterfield has not found moths as abundant as might have been expected in the Keighley district. The migrant *Macroglossum stellatarum* has occurred frequently. Mr. Butterfield refers to it as common, and it is recorded by Dr. Fordham from Barmby Moor on several occasions. It has occurred also several times in the Leeds district. *A. atropos* has appeared rather frequently, and Mr. Hyde has a specimen taken in Doncaster in May measuring $5\frac{1}{8}$ in. across the wings and reports larvæ in the same district in July. A specimen of this moth is reported by Mr. P. Hartley from Blubberhouses.

An interesting feature of the warm summer, writes Mr. Hyde, was that many normally single-brooded *Lepidoptera* produced second broods, whilst some double-brooded butterflies produced three broods. *S. populi* and *C. elpenor*, were double-brooded near Doncaster.

Noctuid moths of the genus *Plusia* have been unusually common near Doncaster and in a small town garden Mr. Hyde records *P. iota, pulchrina, gamma, moneta*, and *chrysites* and notes *P. moneta* and *P. festucæ* as double-brooded, an unusual feature in the north.

**York District** (Arthur Smith) :—

| | | |
|---|---|---|
| Buttercrambe | Mar. 27th. | Came to Light.—*L. multistrigaria, A. æscularia, L. marginata* mostly dark forms, and *P. pedaria* mostly dark forms. Sugar. *T. munda, gothica, instabilis* and *C. vaccinii*. |
| Buttercrambe | Mar. 29th. | At Light. *T. munda, cruda, gothica, instabilis, stabilis, P. rubricosa, C. vaccinii, L. multistrigaria, A. æscularia, L. marginata, A. badiata, A. flavicornies*, and *A. strataria*. |
| Bishop's Wood | Mar. 30th. | *T. populeti, P. rubricosa* in large numbers on the Sallows. |
| Buttercrambe | Apr. 26th. | Sugar. *G. libatriscix, T. munda, gracilis* and many common *Tæniocampa*. On Sallows one *P. piniperda*. |
| Bishop's Wood | Apr. 29th. | Sugar. *G. libatrix* very common. Caught flying one specimen *C. suffumata ab. porrittii*. |
| Bugthorpe | May 11th. | Larvæ of *L. associata* on Red Currant. |
| Sutton-on-Forest | May 18th. | Larvæ of *C. viminalis* plentiful on Sallow. |
| Sandhutton | May 24th. | *E. pusillata* among Spruce. *B. biundularia* and *S. salicata*, found at rest. *E. obliterata* common. |
| Askam Bogs | May 27th. | Sugar. *G. libatrix*, plentiful. *A. unanimis* fairly plentiful. |
| Millington | June 14th. | *I. geryon* not as common as usual. *L. astrarche* also scarce. |
| Strensall | June 23rd. | *E. vespertaria* larvæ as usual, *P. redusa* common in larvæ stage on Dwarf Sallow, *A. inornata* imago one at rest. |
| Strensall | July 12th. | *E. vespertaria* imago *G. papilionaria* and *N. cucullatella*. |
| Burniston | July 16th. | *S. clathrata* very common flying on the cliffs. |
| Wass Bank Top | July 19th. | *P. interrogationis* flying over the heather. |
| Pickering | July 26th. | *A. aglaia* one worn female, *S. semele* common. |

| | | |
|---|---|---|
| Cropston | July 26th. | *E. affinitata* very common, *C. designata* one specimen. |
| Langdale End, Scarborough | July, 30th | *A. aglaia* plentiful. |
| Bugthorpe | Aug. 3rd. | *S. salicata* fairly common. |
| Strensall | Aug. 10th. | Larvæ of *L. camzina*, *N. ziczel*, *N. dromedarius*, *C. duplaris* and *D. falcataria*. |
| Buttercrambe | Sept. 19th. | On Sugar, one female *C. lutosa*, the first, recorded from this locality. |
| Strensall | Sep. 19th. | A freshly emerged specimen of *S. menthastri*. |
| York | Sep. 24th. | In the city at rest on a wall were specimens of *N. c-nigrum* and *A. virgularia*. |
| Buttercrambe | Oct. 8th. | SUGAR. *C. exoleta*, *A. aprilina* and *A. saucia*. |
| Buttercrambe | Oct. 25th. | SUGAR. *C. exoleta*, *A. aprilina* and *M. oxyacanthæ* var. *capucina*, *H. pennaria* found at rest. |

## BOTANICAL SECTION.

(Chris. A. Cheetham) :—This section has again suffered heavy loss by the death of the late Recorder for North Yorkshire, Mr. A. I. Burnley ; he lived too far from Leeds to be able to attend our Section's annual meetings, and so was best known to those who met him in the field. The losses of Mr. Burnley this year and Mr. Beanland last year are felt most when looking over the reports sent in by others and missing their ever helpful and kindly notes.

In turning over the pages of *The Naturalist* this year one finds plenty of evidence showing that a lively interest in botanical matters is still with us. Mr. R. J. Flintoff aroused interest in several old records of plants which lacked recent confirmation, and Mr. Milsom has drawn attention to similar cases in the Bryological lists ; then Mr. Frankland drew attention to the subject of the Palmate Orchids of Craven ; and we have had visits from workers out of other districts to see these and other interesting plants which will be found in our Recorder's lists.

The reports of the Union's excursions show that in field work our section is still a strong and lively body of workers.

First let me quote Mr. A. Wilson's report on the year's weather, and his contrasts with the two previous years :—

' Following a fine, dry and sunny spring, the summer of 1933 has been remarkable for sunshine, high temperatures and dryness. At Ro-wen, N. Wales, the mean temperature for the three months June-August was 61.1 deg. So far this season there have been at Ro-wen 55 days with a maximum temperature in the screen of 70 deg. or over. Last year there were 30 such days, and in 1931 only 7.'

What are we to say about the year as a whole—a wonderful summer, but has it been so from the wild flower display? Speaking generally, we have had fine shows of bloom such as those of the Sloe and the Hawthorn, but how quickly these were over ; even the heather had come and gone ere one realized it was passing. The very short flowering period left us with a lack of bloom at a time when we were also suffering from the drought effect in most places.

A very open winter pushed on the earliest spring flowers, but a keen frosty week at the end of January and the deep snow at the end of February with a cold unseasonable May put a check on the earlier plants ; then from Whitsuntide onwards the warm weather brought out flowers weeks earlier than their normal times of blooming. The bloom of most

species, however, was over very quickly, and the season has not been a flowery one except in our gardens.

Instances of a second flowering of some species have been reported, but not in any great amount. Some fields which made a good display with *Leontodon hispidus* before the hay was cut repeated this in September, and some plants of the Oxeye Daisy did the same. The Honeysuckle has also been mentioned by several observers. A lack of normal colour has been noticed, the Heather and the Copper Beech being specially mentioned.

When we come to assess the year's fruit production the one definite failure is that of the Ash. From every corner the answer is the same : ' No fruit on the Ash.' Very rarely an odd tree may be seen to have from one to a dozen bunches of keys, but a careful watch from above Hawes to Ripon did not produce enough fruit to fill a bucket, and this is the same from Leeds to Ingleton and many other parts of the county. In some cases the particular branch which produced a few fruits showed evidence of damage by wind or other agency. Have we any evidence to show if the Ash produced flowers, and if so was it at some time when fertilization was difficult. The general opinion is that no flowers were produced.

The following table has been extracted from our Section's yearly reports, but unfortunately there is no satisfactory account of the weather conditions in the Union's annual report, and the remarks added are those occasionally found in either botanical or entomological notes.

| | Ash Fruit— | |
|---|---|---|
| 1912 | | A wet season. |
| 1913 | *Plenty* | Hot dry summer. |
| 1914 | Poor. | Dry summer. |
| 1915 | *Good.* | Wet and cold early, fine autumn. |
| 1916 | None. | Cold and wet to July, long and cold winter. |
| 1917 | None. | Long cold winter, cold and wet April, nice summer. |
| 1918 | Average. | Mild early May, hot and fine after. |
| 1919 | Fair. | Late spring and dry summer. |
| 1920 | Poor. | Mild early frosts and gales in May. |
| 1921 | Fair. | Open winter and warm, dry summer. |
| 1922 | *Very good.* | Fine spring but short of sun later. |
| 1923 | Meagre. | Winter lacking frost and summer sunshine. |
| 1924 | Poor. | Wet winter, frosty March, only warm spell in mid June and August. |
| 1925 | Poor. | Cold and wet spring, hot summer, variable after. |
| 1926 | None. | Cold but sunny early, then a normal summer. |
| 1927 | *Heavy.* | Open winter, then frost and wet and cool and showery. |
| 1928 | Below normal. | Exceptionally sunny, but sharp changes of temperature. |
| 1929 | Only moderate. | Hard winter and late frosts, nice summer. |
| 1930 | *Full.* | Variable and unpleasant. |
| 1931 | None. | Cloudy, rainy and cool. |
| 1932 | *Full.* | Cool and wet early, then normal. |
| 1933 | None. | January very mild with a keen frosty week at end ; early February very mild, but heavy snow at end ; May cold, followed by hot dry summer. |

Amongst other trees the Sloe and Crab Apple are variable even in the same district, and the Hazel, which has an abundant crop at Austwick and is good at Huddersfield, is reported poor at Bradford and only moderate in North Wales. The Hawthorn had a wonderful show of flowers. Odd trees, however, are quite bare of fruit, though the majority

are well laden. Sycamore fruits are poor in size even when plentiful, and trees are said to be patchy at Huddersfield and thin near Bradford.

The Oak has a wonderful crop of fruit of a remarkable size, but occasional trees are barren. The Blackberry crop is a good one in all districts, where the drought has been felt most some of the fruit is of small size. Another wonderful sight has been the laden Mountain Ash trees, though strangely a correspondent from Barnoldswick says he has not seen any.

Mr. Wattam's list which follows is a typical one, and mentions many others besides those quoted above.

Pear. Very good, especially so in the Cawthorne district.

Apple. Very good, especially so in the Cawthorne district.

Broad Leaved Elm. Excellent.

Sycamore. Excellent blossoming period; the fruit yield though patchy in places may be described as good.

Ash. Poor; what fruit there is is mostly on trees which bore in 1932.

Birch. Moderate.

Oak. Excellent. There is a great amount of immature fruit, due possibly to the dry conditions.

Elder. Magnificent. In some places quite ripe for harvesting by the end of August.

Beech. Good.

Horse Chestnut. Excellent in blossom with a fruitage yield which may be described as good.

Wild Service. Gave a magnificent display of blossom, with a resultant excellent yield of fruit.

Mountain Ash. Magnificent; one of the outstanding glories of the year.

Hazel. Good.

Hawthorn. Magnificent.

Wild Roses (*Arvensis* and *Canina*). Very good.

Alder. Very good.

Bramble. Magnificent maturing early for gathering by the end of August.

Bilberry. Moderate.

Black Crowberry. Moderate.

Cloudberry. Moderate.

Lime. Plenty of blossom and fairly good fruit crop.

I would add that the Holly is red with berries all over, and that the Cranberry has had a great crop of fruit this year. Instances have been quoted of Holly bearing fruit which have been barren for a great many years. Walnuts have ripened near Settle, which is unusual. Miss C. Johnson mentions the large size and quantity of strong smelling fruit on the Hop. Mr. Haley says that the Spanish Chestnut trees near Dewsbury are laden with fruit of a larger size than he had previously seen. He also states: Another thing one noticed this year, perhaps more than before, is the great number of altered stems. One can generally find amongst nettles, for instance, instead of the usually square stem with opposite and decussate leaves, hexagonal stems with three leaves at each node. We have found the same feature in fig-wort (*Scorophularia nodosa*), and even amongst the privets in our gardens this year there are scores of branches with three leaves at each node, instead of the usual pair. One can still notice the following aliens in the district: *Sisymbrium austriacum*, *Coronilla varia*, *Convolvulus americana*, *Beta trigyna*, and *Claytonia siberica*.

The normal type of secondary growth has not been seen this year but near Huddersfield Mr. Wattam says: In June a perfect pest of larvæ of the moths *T. viridana*, *C. brumata*, *H. defoliaria*, *H. aurantiaria* and *P. pilosaria* defoliated the Oak and Sycamore trees in Molly Carr Wood, Hey Wood, Sun Dean Wood and portions of Deffer Wood. The

Oak trees in late August were canopied with foliage as of early spring ; the Sycamore trees recovered but slowly, their skeleton leaves being curiously prominent.

The drought has been uneven. A note from Mr. Frankland says :— ' Craven seems to have felt it less than most parts. Craven farmers have grumbled somewhat, but after all they have really had little to grumble at, for in between we have had occasional showers to keep things going. At the end of August I spent ten days in Jersey, and I can truly say that from leaving Craven to returning I never saw what I would call a green field. The green vivid colour of the Craven meadows quite dazzled my eyes when I got back.'

Against the last remarks must be put the hardships of the Wold farmers and the water shortage in many places.

Mushrooms have been plentiful and are abundant still in mid-October. This year at Austwick we have had plenty of Parasol mushrooms, *Lepiota procera*, and a brown species, the bleeding mushroom, *Psalliota hæmorrhoidaria*, both of which could not be found in any quantity for the last two years ; they appeared after the rain of early October.

Mr. Winter states : Wych Elm seedlings are decidedly above the normal, Beech seedlings not common ; and Mr. Wattam adds :

The most prominent have been those of Elder, Mountain Ash, Goat Willow and Birch. The two latter are prominent invaders in certain areas. As regards the seeds of *Rosa canina*, mentioned in my report for 1931, of the 200 seeds gathered in November, 1930, and planted April, 1931, fifteen only have made their appearance between the 11th and 26th May.

**Flowering Plants** (Dr. W. A. Sledge) :—No new native species have been added to the Yorkshire lists during the past season, the records which have come to hand being mostly new localities for plants already recorded for the county. Some varieties and micro-species in the critical genera and several aliens are, however, here recorded for the first time for Yorkshire.

East Riding.—A visit to Spurn in May with Mr. R. D'O. Good yielded *Ruppia maritima* L. and *Rhinanthus stenophyllus* Schur, both new to V.C. 61. At Skipwith in September, under the guidance of Miss C. M. Rob, I saw *Apera spica-venti* Beauv. and a rare hybrid dock, *Rumex conglomeratus* × *maritimus*, but a search for *Arnoseris minima* Schweigg and Koerte was unsuccessful. This species which was first recorded for Yorkshire from Allerthorpe Common a few years ago, has been found by Mr. and Mrs. Foggitt at Skipwith, and also (as a casual with *Gilia squarrosa*) by Miss Rob at Topcliffe (V.C. 62).

West Riding.—Mr. Cheetham has recorded in *The Naturalist* his discovery of *Scutellaria minor* Huds. at Keasden, a welcome additional station for a widely distributed British plant which is unaccountably rare in West Yorkshire. Mr. Foggitt records *Mentha gentilis* L. from Tanfield in V.C. 64, and the alien, *Geranium endressi*, from Sharow Lane, Ripon, and Mrs. Foggitt found a *Callitriche* at Austwick Moss which Mr. Pearsall names *C. palustris* L. As this is an ill-understood plant which has been widely confused with other species and which is far rarer than the records for it would indicate, the addition of these authenticated plants constitutes a notable record. The older Yorkshire records for this species all require verification. During the past year I have submitted a set of Carices to Dr. Kukenthal, and the following varieties are mostly new to West Yorkshire :—

*Carex goodenowii* Gay. var. *juncea* (Fr.) Asch., Lawkland Moss.
*C. goodenowii* Gay. var. *recta* (Fleischer), Lawkland Moss.
*C. goodenowii* Gay. var. *strictiformis* Bailey, Lawkland Moss.
*C. elata* All var. *homalocarpa* (Peterm.), Askham Bog.
*C. gracilis* Curt. var. *strictifolia* (Opiz.) Anders., Adel Dam.
*C. gracilis* Curt. var. *tricostata* (Fr.) Asch., Cawthorne.

Dr. Kukenthal refers a sedge from Austwick Moss to *C. inflata*× *vesicaria*, an identification which confirms my own naming of the plant, though no *C. vesicaria* L. could be found in the immediate vicinity. Some very fine examples of the same hybrid I have also collected at Adel Dam, where they grew in company with both parents.

My Yorkshire gatherings of *Alchemilla* have been submitted to the late Dr. Jacquet, and specimens from Ingleborough have been referred to *A. pastoralis* Buser and *A. firma* Buser, both new to V.C. 64, and the latter only previously recorded from Ben Lawers and Teesdale. *A. pratensis* Schmidt, *A. alpestris* Schmidt and *A. minor* Huds. were also represented by several gatherings. These segregates are doubtless common throughout the county, though few records have been published for the restricted plants. The rare *A. hybrida* Mill. is apparently common in the Austwick district, and I also have specimens from Upper Wharfedale. Mr. A. Malins Smith records *A. acutidens* Buser from Bastow Wood, Grassington (*fide* A. J. Wilmott).

North Riding.—For the following list of plants seen during the past summer I am indebted to Mr. and Mrs. T. J. Foggitt. The Rubi have been named by the Rev. H. J. Riddelsdell.

*Tilia platyphyllos* Scop., Richmond.
*Rubus bakeri* F. A. Lees, Gormire, Thirsk.
*R. bakeri* F. A. Lees var. *elongata*, near Aysgarth, Dent and Armescliffe Crags.
*R. mucronatus* Blox., Sowerby, Thirsk.
*R. hystrix* Weihe, Pilmoor.
*R. bellardi* W. and N., Terrington.
*Hieracium caesium* Fr., Rievaulx.
*Mentha longifolia* Huds., Byland, Coxwold.
*Juncus compressus* Jacq., Spa Road, Thirsk.
*Koeleria britannica* (Domin), Forge Valley (found by J. Chapple).

Miss Rob records a new locality for *Ceterach officinarum* Willd. from Bainbridge.

Aliens.—As regards alien plants, the hot summer seems to have favoured their growth judging by the remarkable display of exotics which were seen when I paid my annual visit to the Olympia Oil and Cake Mills sidings at Selby under the guidance of Mr. J. Kendall. Five species and one genus new to the ' British Plant List ' were secured, viz., *Borreria sp. cf. verticillata* L., *Sida rhombifolia* L., *Ipomoea sibirica*, Pers., *Solanum sodomaeum* L., and *Polygonum Bungeanum*. Other ailens which I have not previously recorded from there include *Erysimum cheiranthoides* L., *Xanthium strumarium* L., *Heliotropium europaeum* L., *Hibiscus trionum* L., *Panicum sanguinale* L., *Setaria viridis* Beauv., *S. glauca* Beauv., and *Kochia scoparia* Schrad.

From Skipton Mr. and Mrs. Foggitt record an alien dodder, *C. suaveolens* Ser., parasitising and doing very extensive damage to a field of beetroot.

From the North Riding I have a record of *Stachys annua* L. from Thornton Dale, whilst for the following list of aliens I am indebted to Miss C. M. Rob :—

*Rapistrum orientale* Crantz, Warrenby, V.C. 62.
*Impatiens glandulifera* Royle, Dalton Bridge, V.C. 62.
*Medicago denticulata* (Willd.), Topcliffe, V.C. 62.
*M. minima* (L.) Desr., Topcliffe, V.C. 62.
*Melilotus alba* Desr., Catton, V.C. 62.
*Carum carvi* L., Marset, V.C. 65.
*Caucalis daucoides* L., Tanfield, V.C. 65.
*Xanthium spinosum* L., Thorpfield, Thirsk, V.C. 62.
*Senecio squalidus* L., Warrenby, V.C. 62.

*Silybum marianum* Gaertn., Carlton Miniott, V.C. 62.
*Verbascum nigrum* L., Topcliffe, V.C. 62 ; Tanfield, V.C. 65.
*Mimulus moschatus* Dougl., Castle Howard, V.C. 62 ; Blubberhouses, V.C. 64.
*Antirrhinum orontium* L., Catton, V.C. 62 (with vegetable seeds).
*Rumex scutatus* L., Settle, V.C. 64.
*Allium paradoxum* G. Don., Camp Hill, Bedale, V.C. 65.
*Ornithogalum nutans* L., Sowerby, Thirsk, V.C. 62 (Baker's station)
*Panicum crus-galli* L., Tanfield, V.C. 65.
*Setaria viridis* Beauv., Tanfield, V.C. 65.

**Ecological Committee** (Miss D. Hilary) :—Members of the Committee have been present at all the ordinary meetings of the Union, and from time to time reports on the Ecology of the districts visited have appeared in *The Naturalist.*

In connection with the special work which the Committee as a whole is doing, viz., the investigation of the degeneration of the Juniper Scrub on Moughton Fell, we can definitely report that the dying out of the Juniper is not due to fire, as we are watching certain plants which are dying and no trace of burning has been found during the two years in which they have been under investigation.

A successful field meeting was held on September 23rd, when Professor Comber kindly visited the plots with us, taking back with him many samples of soil. He has kindly promised to carry out a soil survey in due course, for which we are very grateful. Another point of interest is the fact that Gymnosporangium is found most abundantly on Mountain Ash and not on Hawthorn in the immediate Juniper examined, so that there seems to be no doubt that the alternative host is *Pyrus aucuparia* in this area.

We are also carefully watching the repopulation of a bared plot, and one of our members, Mr. Wattam, is working on the germination of the Juniper seed.

Other members of the Committee are carrying out individual work :—Dr. Pearsall investigating the Relation of Light and Plant Distribution in Lake Windermere ; and Dr. Grainger has been carrying out a soil survey in the Huddersfield district and reports that while in some areas there is a very close connection between geological strata and soil, in others there is no connection at all.

Mr. Mason sends the following account of the Ecology of the fungi. The autumn crops of fungi, especially those belonging to the agaricales and other fleshy forms have been unusually small in numbers, and greatly restricted in species. Two kinds of summer weather appear to have marked inhibitive effect upon mycelial development, viz., a dull cold summer in which growth is restricted and is not sufficiently advanced by September to give rise to sporophores, and during such severe drought conditions as those experienced this year when the mycelium, although developing well in the earlier months, suffers desiccation in July and August. Such mycelial growths as had been less exposed to desiccation by reason of close proximity to constantly available water supply, produced their sporophores earlier than usual, and at the beginning of August there were many more fleshy species in evidence than was the case in September and early October when they are normally most prolific in their occurrence. In my experience there has never been a year in which species of Russula, Lactarius, and Hygrophorus have been so scarce, and to a lesser extent, the same may be said of Collybia, Marasmius, Entoloma, Stropharia, Hypholoma and Coprinus. It is, of course, likely that coprophilic species might be expected to suffer reduction in numbers, and until October the usually common species of Stropharia, Panaeolus, Anellaria and Coprinus were practically absent from the fields.

An unusual habitat for a species of Psalliota has been, and apparently still is, the mortar of the brickwork in a manhole near Grove Lane, Headingley, where *Psalliota sanguinaria*, a new Yorkshire species, has occurred since June of this year, and two gatherings here reached me from Mr. Persy Fisher.

**Bryology** (F. E. Milsom) :—Field work, owing to the abnormally dry summer, has been more or less confined to the earlier and later parts of the year. At the Dent meeting at Whitsun, bryology was confined to the wetter parts, and a trip to Upper Teesdale, undertaken subsequently in order to confirm some of the older records, was somewhat of a failure. Nevertheless, it has been a successful year. Among new records, it is satisfactory to report that *Orthodontium gracile* var. *heterocarpum* has been discovered in V.C. 61, thus completing its known range in all the five vice-counties of Yorkshire. It was abundant in three localities in the Skipwith district, and in view of this district having been intensively worked in the past by such men as Ingham, it is difficult to avoid the conclusion that the moss is at present spreading its range.

Other new vice-comital records are :

Mosses.

*Barbula Nicholsoni* Culmann, found by Mr. J. B. Duncan on the banks of the Wharfe at Harewood Bridge (V.C. 64).

*Heterocladium heteropterum* B. and S. var. *fallax* Milde (V.C. 65).

Hepatics.

*Nowellia curvifolia* (Dicks.) Mitt. (V.C. 65).

*Lejeuna patens* Lindb. (V.C. 65).

Confirmation of previous records of rare species are the following :—

*Dicranum undulatum* Ehrh. between Skipwith and Thorganby (V.C. 61).

*Catoscopium nigritum* Brid. near Malham Tarn (V.C. 64).

*Gymnomitrium obtusum* (Lindb.) Pears., on Holwick Scar and Cronkley Scar (V.C. 65).

*Anastrepta orcadensis* (Hook) Schiffn, on Frostrow Fell, Sedbergh (V.C. 65).

The past season seems to have been a good one for fruiting mosses, and the following information is recorded as to species, normally rare in fruit, which have been found fruiting this year.

*Trichostomum tortuosum* Dixon (V.C. 64).

*Anomodon viticulosus* Hook and Tayl. on Giggleswick Scar (V.C. 64).

*Mnium undulatum* L. near Oxenber (V.C. 64).

*Neckera crispa* Hedw. (V.C. 65).

*Hypnum stellatum* Schreb, var. *protensum* Roehl on Hook Moor (V.C. 64).

*Hypnum scorpioides* L. on Helwith Moss (V.C. 64).

*Hylocomium squarrosum* B. and S. (V.C. 64).

In conclusion, emphasis is again laid on the desirability of confirming old records of rare species, several of which have remained unconfirmed for many years.

**Mycological Committee** (Dr. J. Grainger) :—The attention of the Committee has been turned more definitely to the Ascomycetes, in addition to the other groups capable of field study. At the meeting at Barnard Castle, Mr. Petch gave an excellent account of the classification of the Pyrenomycetes, and signified his willingness to prepare an annotated list of species of several common genera. This work should go far in forming the basis for extended study, not only by members of the Committee, but by all mycological students. Mr. A. A. Pearson is making a parallel contribution, in the preparation of a list of modern names for Cooke's *Illustrations of British Fungi*. Both papers are being prepared with a view to publication.

Mr. T. Petch, B.A., B.Sc., has been elected Chairman for the coming year, and Mr. Illingworth and Miss Hughes have been elected members ; otherwise there is no change in the constitution of the Committee.

The dry season resulted in a very sparse fungus flora, but when rain fell in October, conditions changed very quickly. Numbers of species fruited very rapidly, and almost balanced the previous scarcity. Full lists of species found on the fungus foray at Barnard Castle (September 16th-23rd) have appeared in *The Naturalist*.

## CONCHOLOGICAL SECTION.

**Conchology** (Mrs. E. M. Morehouse) :—We have not had a really good year among the land molluses, perhaps one of the outstanding features being the occurrence of *Hygromia fusca* Montagu in so many parts of the county. This mollusc, while not being rare, is uncommon, where it does turn up, it is often there in great numbers. Mr. H. J. Armstrong found it in Milner Woods, Thorner, this being a new record for that area. Mr. W. P. Winter took it on some young Sycamores in Mackershaw Woods, Ripon. This species favours the tall grasses, Iris and Meadow Sweet.

In a quarry at Cridling Stubbs in June there were hundreds of *Helicella caperata* Montagu, that day the conditions were ideal, rain having fallen for an hour or two prior to our visit. At a later date in September, thirteen species were taken in the same place, which was remarkable after the severe drought of July, August and September. Another habitat has been found in a quarry (disused), near Stapleton Park, Pontefract, for *Caecillioides acicula* Müller.

Mr. Armstrong found *Vitrea lucida* Dlap. in his garden on October 14th ; it had evidently come while young with some plants and escaped notice until fully grown.

*Vivipara contecta* Millet, shows a steady increase in the habitat near Doncaster, where for several years it has struggled against extermination.

Miss J. Dufty found a reversed *Limnæa peregra* Müller, in a new area.

Mr. J. D. Livesey, on three occasions at the Doncaster Gas Works, found *Physa heterostropha* Say., in a small tank fed by a pipe conveying water from the canal. It is a new record for this district. This species, although appearing in the British list, has been introduced into this country from America. For many years it has been found in the canal near Manchester and in different parts of Lancashire.

Mr. Armstrong found *Paludestrina Jenkinsi* v. *carinata* Smith, in the canal, at Agbrig, Wakefield.

## GEOLOGICAL SECTION.

**Coast Erosion** :—The dryness of the summer has perhaps made the effect of the erosion of the drifts of the coast of Holderness less noticeable than usual and probably accounts for the lack of the usual press scares, such as houses falling over the cliffs, etc. As a result of the erosion, a tusk of *Elephas antiquus* about four feet long and found near Bridlington some time ago by the Rev. J. S. Purvis and the late Capt. G. B. Purvis, has just been presented to the Municipal Museum at Hull.

**Geological Photographs** :—The Convener has taken about 100 photographs during the year in the East Riding in the course of the excursions of the Hull Geological Society while the visit of the Geologists' Association to the Holderness coast in August afforded further opportunity of recording photographically this ever-changing coast. The Albums of the Union are in good order.

**Temporary Sections** :—It is a matter of some disappointment that no records have been sent on to the Convener during the year. There are very many places where road-widening, building, drainage operations and the like are in progress and unless immediate steps are taken to place on record details of the rocks exposed, very valuable facts may be permanently lost. The attention of all members of the Union is drawn to the necessity and urgency of this work.

## INCOME & EXPENDITURE ACCOUNT to Oct. 31, 1933.

### INCOME.

| | £ s. d. | £ s. d. |
|---|---|---|
| Members' Annual Subscriptions, arrears | 13 5 0 | |
| ,, 1933 | 57 12 6 | |
| ,, 1934 | 2 5 0 | |
| Levies from Affiliated Societies, arrears | 3 4 5 | |
| ,, 1933 | 11 9 7 | |
| | | 73 2 6 |
| Interest on 4% Consols | 6 0 0 | |
| ,, 4½% Conversion | 7 13 8 | |
| ,, 3½% War Loan | 4 5 0 | |
| | | 17 18 8 |
| 'Booth' Fund for printing | | 3 10 0 |
| 'Cheesman' Fund for Illustrations... ... | | 4 5 0 |
| *Naturalist*— | | |
| Subscriptions, arrears | 26 10 0 | |
| ,, 1933 | 114 2 0 | |
| ,, 1934 | 4 10 0 | |
| | | 145 2 0 |
| Balance of Expenditure over Income... | | 22 2 11 |
| | | £280 15 1 |

### EXPENDITURE.

| | £ s. d. | £ s. d. |
|---|---|---|
| Expenses of Meetings— | | |
| Secretary's Expenses, arrears, | 10 10 0 | |
| ,, ,, 1933 | 10 10 0 | |
| General Expenses... | 1 18 0 | |
| Secretary's Stationery | 0 10 6 | |
| | | 23 8 6 |
| Printing and Stationery and Postages (General A/c) ... | | 58 10 4 |
| Treasurer's Stationery ... | 1 6 6 | |
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| Editors' Postages, etc. ... | 6 7 2 | |
| | | 178 15 5 |
| Sundry Expenses— | | |
| Bank Charges ... ... ... | | 0 17 4 |
| Wreaths ... ... ... ... | | 2 1 4 |
| Income Tax ... ... ... ... | | 5 15 0 |
| | | £280 15 1 |

## BALANCE SHEET, October 31, 1933.

### LIABILITIES.

| | £ s. d. |
|---|---|
| *Naturalist*, etc. ... ... ... ... | 83 13 6 |
| Subscriptions paid in advance ... | 6 15 0 |
| Life Members' account ... ... | 323 8 0 |
| Balance of Assets over Liabilities ... | 137 14 7 |
| | £551 11 1 |

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### ASSETS.

| | £ s. d. | £ s. d. |
|---|---|---|
| Cash at Bank ... ... ... ... | | 2 2 5 |
| ,, in hands of Treasurer ... ... | | 5 14 10 |
| ,, in hands of Editors ... ... | | 2 12 10 |
| £200 4% Consols ... ... ... | | 221 0 0 |
| £170 16s. 9d. 4½% Conversion... ... | | 189 11 0 |
| £100 3½% War Loan ... ... ... | | 100 10 0 |
| Subscriptions in arrears | 55 0 0 | |
| Written off as unrealizable | 25 0 0 | |
| | | 30 0 0 |
| 'Booth' Fund, £100 3½% Conversion Loan. 'Cheesman' Fund, £100 3½% War Loan. | | |
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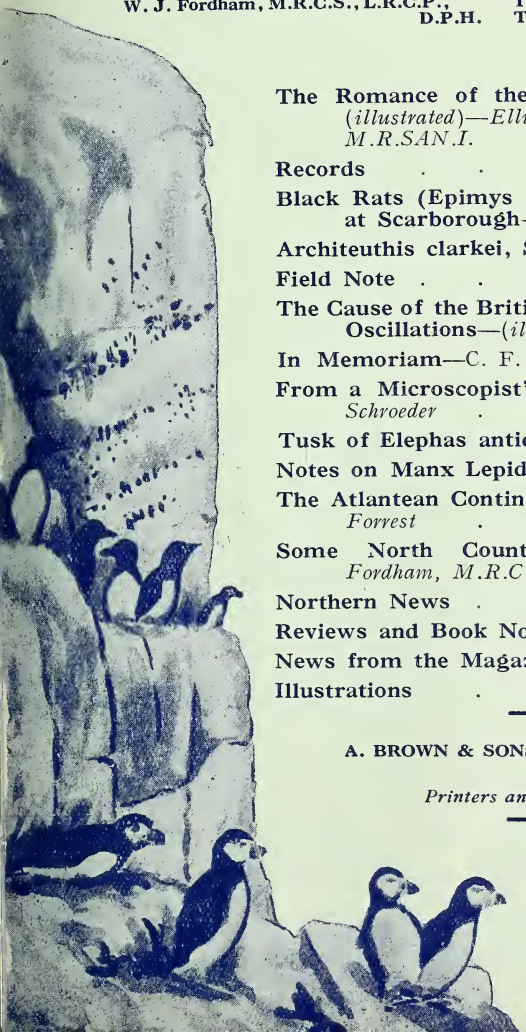

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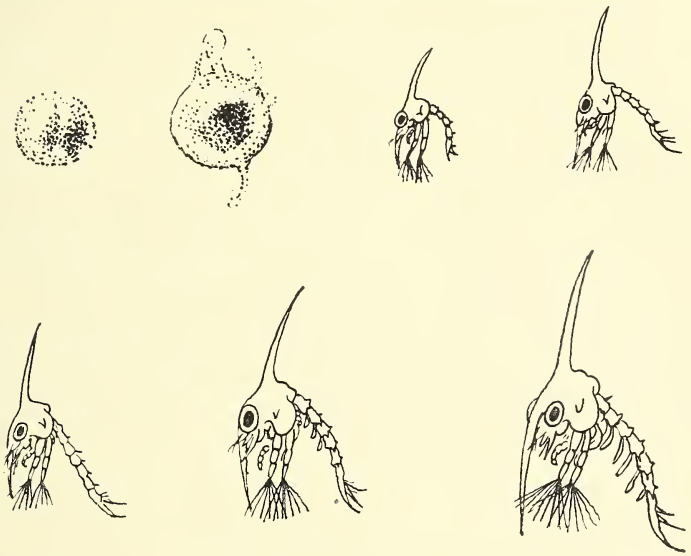

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is enjoyed by most persons. Its delicate flavour, nutritious properties and the fact that the flesh is rich in phosphates, occasion it to be sought after as an article of diet. Few are probably aware, however, of the crustacean's precarious, but none the less interesting, life in the sea, or the dangers that beset the young crab before it attains a size capable of defending itself against the numerous enemies which constantly threaten its existence. When it is explained that out of every ten thousand eggs hatched, only about two of the larvæ survive, it can be well understood why the young crab is sometimes called a " child of chance."

Of the numerous species of crab the European and American are probably the most valuable of all the edible varieties. In the United States there exists three crustaceans

possessing the qualifications of a valuable food resource. These are the Blue Crab (*Callinectus sapidus*), which inhabits the waters around the South Atlantic coasts ; the Edible Crab (*Cancer magister*) of the Pacific Coast ; and the Rock Crab (*Cancer irrotatus*), common on the New England coast. Of the above, the Blue Crab is probably the most abundant and is consumed in large quantities.

The common edible crab (*Cancer papurus*) lives off the coasts of Great Britain and Ireland, preferring situations where the sea bottom is rocky and the nooks and crannies afford suitable hiding places. The chief fisheries are in the English Channel, but other important centres are Flamborough, Filey, Whitby, Dunbar, Wick, Cromer and Selsey. The largest crabs are caught off Devon and Cornwall and sometimes measure 11 in. to 12 in. across the back and weigh from nine to twelve pounds each. The esteem in which the edible crab is universally held as a food is indicated by the numbers brought to market. During 1932 the number of British taking landed in England and Wales was 55,116 hundred to the value of £60,483, and in Scotland 1,906,742 crabs to the value of £11,385. Crabs are in season all the year round but in best condition in April, May and June, and are most abundant during these months.

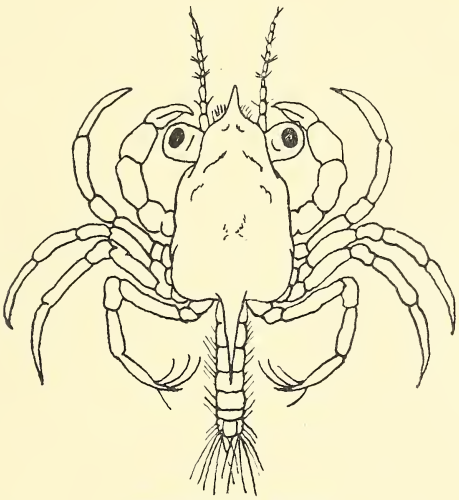
The crustacean is a cautious, shy and cunning animal with a keen sense of smell and touch. It is mainly carnivorous in its habits, but has no canabalistic instincts. To fight the battle of life unseen is its great purpose. The fighting habits of crabs are not confined to their enemies ; they also fight amongst themselves, losing claws and legs in the fray.

The crab is a night feeder, and, standing in the shadow of a rock, with its great claws extended, grips at all comers ; or buries itself in the sand with the exception of its eyes and tips of nippers, and lies in wait for wandering soles or plaice, etc. Not being very nimble in its movements its captures are achieved more by strategy and cunning than by activity. It prefers the flesh of red coloured fish, such as red mullet, red guarnards, or strong perfumed fish such as the white hound shark. It will, however, eat mussels and other small shell fish, cracking them with its pincher-like claws.

When travelling over the sea bottom it walks nimbly (very like an insect) on the tips of its slender legs, with the nipping claws either extended or folded close under the shell. As each leg terminates in a spike it can climb among the rocks like a huge spider and if frightened usually runs backwards.

The body and limbs of the common crab are encased in a strong stoney, shell-like armour which really consists of three layers pierced by delicate channels and possessing all the necessary conditions of a true skin. Hairs growing on various

parts of the body, especially near the head, are connected with the nervous system. This armour, which is called "chitin" and hardened by salts of lime, is thin and soft at the joints, allowing free movement of the parts. The large granulated shell, called the 'carapace,' which is lined with a membrane, protects and gives support to the internal organs, and also affords points of attachment for the muscles by means of which the animal moves, thus acting as a sort of outside skeleton. Attached to the body are the four pairs of true walking angular-shaped legs on which grow numerous bundles of stiff hairs of a red colour. In front of these are the



**The Megalopa Stage.**

large powerful pair of nipping claws (chelœ), one claw always being larger than the other. The eyes are set on moveable stalks and can be turned in any direction.

One of the most curious features about the crab is its power to voluntarily cast its limbs (autotomy) and should one of these become injured or seized during a fight it can, by causing a spasmodic contraction of certain leg muscles, surrender the limb. After a time a new limb begins to grow and further growth takes place each time the crab moults, until, finally, a perfect limb is formed. In Southern Spain the phenomena of autotomy is taken advantage of by the fishermen, *i.e.* when the crabs are trapped the large claws are removed and sent to market, the crabs being put back into the sea to grow new ones.

The shell of the crab does not increase in size to any appreciable extent, so that it becomes necessary for it to cast

its shell entirely at certain intervals, and, of course, more frequently when young. As the time of moulting (called ecdysis) approaches the crab appears uneasy and shy and seeks shelter. The shell undergoes a peculiar change and loses its bright colour. The process usually takes place in the autumn and is so complete that not only is the outer covering of the body shed, but every limb is drawn out of its hard sheath and the colouring of the eyes and the delicate feelers and gills, and even the cuticular lining of the stomach are cast off. When about to shed the shell (carapace) opens on each side, at a seam-like articulation. This line is plainly seen in the full-grown crab. The shell acts like a lid lifted up and there is a gap between it and the abdomen which is the first part to be withdrawn, followed by the legs. The crab is always considerably larger than the shell from which it has withdrawn, and the latter is as perfect and unbroken as ever and looks like a dull live crab.

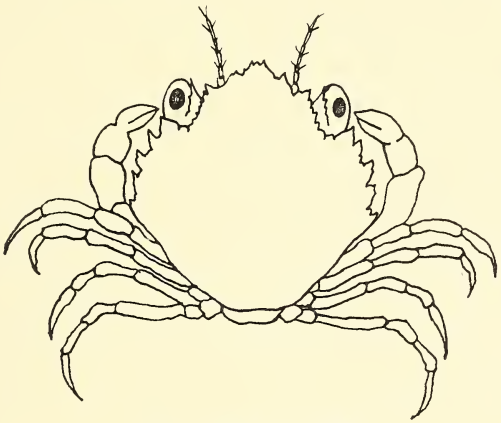
After moulting it is called a " soft " crab and appears as a plump inert purple-coloured mass, later changing to a light brick red with under surface white. The flesh is soft and flabby, and rapidly increases in size owing to the absorption of water. During this period the crab hides itself, as being in a feeble and defenceless condition it is most liable to attacks from its enemies, which include the conger eel, cod fish, skate, rays and nursehound sharks ; its greatest enemy is the octopus. The newly-formed shell gradually hardens by the deposition of lime salts, but it takes four or five months before the shell is really hard. A crab may live as long as nine years and moult for at least five years and at maturity is about $4\frac{1}{8}$ in. across the broadest part of the back. When it becomes too old to moult or breed it is called a ' collie ' and is regarded by the fishermen as quite useless.

The crab is extremely sensitive to loud noises. For instance, a gun fired near by may cause it to shed some of its claws ; the same effect is sometimes produced by a thunderstorm. Crabs can foretell the weather twenty-four hours in advance and will not move if a storm is approaching. A large number are doubtless killed by storms during the year.

The migratory habit of crabs is well known and is governed by abundance of food and the temperature of the water. The sex can be easily distinguished. The male or cock has larger claws in proportion to the body, the apron or flap is narrow, hairless, and lies close to the body. The female, or hen, has a broad flap or apron, more rounded and fringed with hair. The shell is more convex than that of the male, which is nearly flat. On the underside of the apron the hen carries eight bunches of eggs (termed the ' coral '), these may number anything up to 2,000,000,

according to size and during which period she is called a ' berried hen ' or ' hen in berry.'

The newly-spawned globular-shaped egg is orange in colour, later changing to turkey red. Spawning takes place in deep water in winter and the eggs hatch in the following summer in the in-shore waters which provide warmth and food for the crab larvæ. The larva when first escaping from the egg presents a curious and grotesque appearance and not at all like a crab. The body is hemispherical and its back prolonged upwards into a horn-like appearance. The feet are scarcely visible except the last two pairs, which are feathery



**First Young Crab Stage.**

and used for swimming. Moulting, however, soon takes place and the larva passes into the next stage. There are five progressive larval stages lasting over a period of two months, each successive moult showing some new development, and then a specialised condition called the ' Megalopa ' before finally reaching the first young crab stage. The larva is orange to reddish in colour and has large staring, black eyes marked with yellow and orange, a long beak projects from the lower surface of the head. It feeds on living microscopic plants and minute larval forms of marine animals. Its conspicuous colouration and fairly large size makes it an easy prey for a host of enemies, which include the herring, mackerel, and cod. In the final megalopa stage it assumes a different shape and is more crab-like in appearance, *i.e.* the eyes become pedunculated (stalk-eyed) the tail flat and there is the full complement of legs and claws ; it, however, still retains its swimming powers. It becomes a fearless, voracious little cannibal, eating its own brothers and sisters, and also preys upon fairly large crustacea, crab's eggs and

dying or dead planktonic animals. Later it loses its swimming abilities, moults, and commences the first young crab stage.

The tiny crab seeks the protection of stones and rocks under which to hide from its enemies. It moults frequently, but less often as it gets older, finally becoming the mature crustacean. The small crab has a wonderful trick of feigning death when in difficulties, and will continue in this state for some time, in fact it either fights or mimics the departed.

Crabs are caught in hemispherical creels or pots of wicker work, or hoops covered with netting, with funnel-shaped openings permitting the crab's entrance, but preventing its escape. The traps, which are baited with clean, fresh fish (this is most essential), such as cod's heads, pollock, skate, haddock, herring, etc., are sunk to the sea bottom, their position being marked by buoys. They are caught in greatest quantity where the water is thick and muddy and in warm or rainy weather. The crab has a keen sense of smell and exceedingly voracious and crowds into the trap in search of food. This extreme liveliness is in great contrast to the normal sluggish habits of the species.

Crabs are sent to market alive, packed in heather or seaweed and enclosed in kits, barrels or boxes. They are usually killed before they are boiled, otherwise they will cast their claws. This is accomplished by forcing a sharp-pointed instrument into the flesh between the eyes. Boiled crabs do not keep many days in hot weather, this is shown by discolouration of the apron, from which an indescribable odour issues, parts beneath the claws, also become sticky and wet. The joints of a fresh crab are rigid. If the crab appears faded in appearance it is indicative of staleness.

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## RECORDS.

### PURPLE SAXIFRAGE AGAIN BLOOMS IN FEBRUARY

Last year I reported the earliest date on which I had seen flowers of *Saxifraga oppositifolia*, this was February 15th, and on that occasion one mass some nine inches across was in full flower. This year I found the same patch in full bloom on February 17th, and also three or four other masses on this part of the limestone cliff on Penyghent.

Judging by other species of plants, I do not think this year has produced such abnormal early flowers as the last; the Laurel-leaved Daphne was only just in bloom on February 10th, and I did not see a Coltsfoot until February 15th, whereas last year, and more especially the previous year, Celandines were blooming in January.—CHRIS. A. CHEETHAM.

### NEWSTEADIA FLOCCOSA (DE G.) IN DERBYSHIRE.

In *The Naturalist* for 1925, p. 345, I reported this species of Scale insect as occurring in Derbyshire. During January and February of the present year I have again come across it in quantity beneath rotting trunks in the Padley Woods, near Grindleford. The species is commonly reported as living in moss. The specimens noticed were all females in various stages of growth.—J. M. Brown, Sheffield.

### THE TREE SPARROW.

The Tree Sparrow, on the authority of the *Birds of Yorkshire*, is known at Halifax as 'Rock Sparrow,' rather implying that the bird is well known, but the exact contrary is the fact. At the extreme western end of the Upper Calder Valley (Todmorden to Hebden Bridge) it is absent, a few miles to the east it occurs sparingly, but still further eastward (at Elland and Brookfoot) small colonies have nested. From November 26th to the end of the year, and in the New Year, a flock of from 50 to 100 has frequented a small sewage bed midway between Sowerby Bridge and Copley. The dark feathers in the centre of the white cheeks, chocolate head, faint double bar on wings, and what, when the birds are in a certain posture, almost looks like a white ring round the neck, were noticed. When not feeding on the ground and when at rest together in the trees they often indulged in a concerted twittering.—Walter Greaves.

### *CAENOPSIS FISSIROSTRIS*, WALT., A WEEVIL NEW TO THE NORTH OF ENGLAND.

Whilst examining afresh my specimens of the Curculionid genus *Otiorrhynchus*, I was struck by the peculiarity of a specimen which had apparently been determined in error as a representative of that genus. It turned out to be *Caenopsis fissirostris* Walt., and for its authoritative determination I have to thank Mr. J. J. Walker, of Oxford.

The specimen was found on Adel Moor, near Leeds, in May, 1931, and is of special interest in so far as it has apparently not been referred to before as occurring further north than Cannock Chase (Fowler, Vol. V, p. 187). Joy refers to it as rare. Mr. Walker informs me he has taken it on several occasions, mostly singly, in the South of England, in moss, dead leaves, and more frequently in sand pits.

The insect differs from *C. waltoni* Boh., the only other British representative of the genus, in having the thorax not so broad and being considerably larger (4·5 to 5 mm.).—John R. Dibb, F.R.E.S.

*1934 March 1*

CUMBERLAND BRACONIDÆ.

Among a number of Braconidæ determined by Mr. Claude Morley were the following species from Cumberland :—*Bracon prætermissus* Marsll. near Longtown, 30/6/31, a widely distributed and fairly common species. *Euphorus pallidipes* Curt., Blackford, 2/8/28, also a common species. *Cœlinius gracilis*, Easton, near Longtown, 25/6/29. *Phænocarpa ruficeps* Nees., Easton, 25/6/29, and a ♀ at Kelsick, 8/10/25. *P. pullata* Hal., Kelsick, 8/10/25, also a fairly common species. *Rhizarcha straminipes* Hal., a ♂ from Hawthorn flowers at Scaleby, 22/5/26, and a ♀ from flood refuse from the River Esk near Mossband. *R. alecto* Mor., a ♀ from Kelsick, 21/4/25. All taken by sweeping low herbage, unless otherwise stated.—Jas. Murray, Gretna.

## BLACK RATS (*EPIMYS RATTUS—MUS RATTUS RATTUS*) AT SCARBOROUGH.

W. J. CLARKE.

While Mr. Eric Hardy's very interesting note on the Black Rat (*Naturalist*, January, 1934) appears to show a decline in the numbers of this species on Merseyside, there is also evidence to show that there has been an increase in numbers at some other places.

I can only speak for Scarborough with any certainty—a small port where very little foreign shipping arrives beyond an odd Norwegian timber boat, or a Dutch herring fisher.

Here, prior to 1900, the Black Rat was known only as an extreme rarity at long intervals. In that year five were killed on the harbour side and their occurrence created great interest. In 1901 three were caught on the piers. No more were seen until 1905 when ten were taken on the fish market, some of which went alive to the Zoo, and others found their way into various museums. From then until 1926 no more were seen, but in that year 38 were caught, no brown rat being seen. This caused an intensive trapping scheme to be started and 1927 yielded 23 Black Rats and 1 Brown Rat.

The figures for succeeding years were :—

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1928 | ... | 123 | Black Rats, | | 4 | Brown Rats. | |
| 1929 | ... | 95 | ,, | ,, | 2 | ,, | ,, |
| 1930 | ... | 58 | ,, | ,, | 1 | ,, | ,, |
| 1931 | ... | 49 | ,, | ,, | 3 | ,, | ,, |
| 1932 | ... | 15 | ,, | ,, | 4 | ,, | ,, |
| 1933 | ... | none | | | none | | |

The apparent decline in numbers is due to a gradual cessation of trapping terminating in none at all being done during 1933. Black Rats are still plentiful about the harbour, and have penetrated into the town as far as the Market Hall.

## *ARCHITEUTHIS CLARKEI*, SP. N.

In the *Proceedings of the Zoological Society of London*, published on September 20th, 1933, Mr. G. C. Robson, M.A., F.Z.S., of the Zoological Department, British Museum (Natural History), contributes an illustrated article describing *Architeuthis clarkei*, a new species of Giant Squid, with observations on the genus. After describing the circumstances of the stranding of the Squid at Scarborough on January 14th, 1933, Mr. Robson writes :

' Records of the occurrence of Giant Squids on the Atlantic coasts are now nearly four hundred years old, and if we accept the view that the Kraken of Norse mythology is no other creature, its existence has been known to the maritime folk of Western Europe for a far longer period. Knowledge concerning Giant Squids has been accumulating for the past eighty years, and the exact study of the group was started by Steenstrup in the middle of the last century. Undoubtedly several imperfectly distinguished forms have been included in the earlier anecdotal records of Architeuthis. Moreover specimens of Architeuthis (the Giant Squid *par excellence*), the smaller Sthenoteuthis, and possibly Ommatostrephes, have been indiscriminately described as " Giant Squids." The present review of the subject deals only with the undoubted records, etc., of Architeuthis.

' The genus Architeuthis, according to the last comprehensive review (Pfeffer, 1912), has an almost world-wide distribution. In this paper we are primarily concerned with the Atlantic forms. Specimens referable to the genus have been stranded or observed (alive or dead) far from the coast on both sides of the Atlantic. The distribution is curious inasmuch as on the Western shores the records are concentrated on Newfoundland and the immediate vicinity, whereas on the Eastern coasts they are far more widely scattered over an area from North Norway to the Azores. From the distributional point of view the new record from Scarborough is very interesting. Hitherto Architeuthis has only been recorded in the North Sea from the East Scottish coast as far south as Dunbar, and from Denmark. The present record is the farthest south that a member of the genus has penetrated in the North Sea. The stranding at Scarborough is of further interest, as it is in that area that hitherto our records of large oceanic squids, represented by Sthenoteuthis, which have penetrated into the North Sea, have been mainly concentrated. This subject has been discussed by Clarke and Robson (1930), and the stranding of our Architeuthis on the coast of Yorkshire is additional substantiation of the theory advanced by those authors that stray members of the Atlantic cephalopod fauna

caught in the south-going North Sea current are ultimately washed ashore on the coast of Yorkshire, owing to the south-going current spending itself against the broken circulation in the south end of the North Sea.

'*Architeuthis clarkei* has been named in honour of Mr. W. J. Clarke, of Scarborough, who has for many years been a zealous observer of Cephalopods in the North Sea, and to whose activity I am greatly indebted.'

After giving measurements and many comparisons between this, and known species of the genus, Mr. Robson reviews the distribution and previous records of Giant Squids in the North Atlantic. The facts related ' will at once strike the reader as very curious. In the Western Atlantic the records are concentrated mainly in the region of the Grand Banks and Newfoundland. Except for two outlying records—one in Davis Straits and one off Charlestown—and one of unknown location, they all relate to animals seen or caught in the circumscribed area mentioned above. In the Eastern and North-eastern Atlantic the animals have been found more widely scattered over a larger area, embracing Iceland, Norway, West Ireland, the Shetlands, and the North Sea, with a subordinate focus in the Azores. This disparity in size of the distributional area calls for explanation ; but before attempting this we should note certain important points.

'(1) Many of the Squids found on the European coasts are stranded on the littoral either alive or in a sufficiently fresh condition to suggest very forcibly that they were alive not long before the time of stranding. This, I think, shows that there is an indigenous Architeuthis population in the East Atlantic, and that the East Atlantic specimens are not isolated stragglers drifted across the Atlantic.

'(2) At present it seems that the animals are found (*a*) stranded, (*b*) floating (usually dead) at the surface, and (*c*) as vestiges in the stomachs of whales. They are not found regularly and frequently in either area living the life of the shallow-water fauna. This suggests that their real home is in deeper water at some distance from the coast, a fact which is further strengthened by the frequency with which sperm whales are found lacerated by their beaks and scarred by their suckers. This, to my mind, suggests a larger concentration of Giant Squids than is evidenced by the inshore records, in the feeding grounds of the whale, perhaps at 1—200 fathoms.

'(3) It must be borne in mind that we may be dealing either with a single or two separate populations—that of West Europe and that of the Grand Banks. Architeuthis may either be distributed all over the Atlantic, or it may be an inhabitant mainly of the edge of the continental slope on

each side. On this point we have no evidence to guide us, though I incline to the latter view.

'In spite of their great size the Giant Squids examined in this study convey an impression neither of great mobility nor of adaptation to that aggressive mode of life which is suggested by the structure of, *e.g.* Sthenoteuthis. Inferences as to mode of life and completeness of adaptation from structure alone are apt to be misleading ; but the following features of Architeuthis contrasted with those of its smaller relatives suggest that it is a sluggish and inert creature.

'(1) The fins are remarkably small in relation to the total size of the body and head. In *A. clarkei* their total width is only 29 per cent. of the dorsal body-length as compared with 79 per cent. in *Sthenoteuthis caroli*.

'(2) The locking apparatus of the funnel mechanism is remarkably feeble and ill-developed or degenerate, and again affords a marked contrast with the very efficient apparatus of Sthenoteuthis.

'(3) The suckers are very small, and their teeth are diminutive and feeble as compared with the large and strong suckers and teeth of Sthenoteuthis. In *S. caroli* the largest suckers are 2.6 per cent. of the mantle-length ; in *A. clarkei* they are 1.1 per cent.

'(4) The lateral and dorsal membranes of the arms are very poorly developed as compared with those of other genera.

' It may be mentioned that the radula is exceptionally small.

' I am inclined on the whole to think that Architeuthis is rather a sluggish animal living near the upper stretches of the continental slope in water between 100—200 fathoms, or deeper where the surface temperatures are high. The structure of the suckers suggests that it does not deal with large prey. The remarkably small size of the fins suggests an inactive life, so that it may keep near the bottom and feed on sedentary invertebrates and carrion.'

## FIELD NOTE.

**Ornithological notes from Halifax district.**—On September 17th, 1933, Mr. George Edwards and myself, both of Halifax, visited White Holme Reservoir, Blackstone Edge. We were equipped with binoculars, mine being a pair of power-10 Goerz of large aperture. It was a beautifully clear day and the visibility perfect. Numerous Lapwing, Curlew, and Duck were at this sheet of water, and we also noticed some small Waders in a group. Teal, Tufted Duck, and Golden Plover were also present. A closer approach to the Waders revealed about fifteen Dunlin and two Sanderlings. Redshank were observed as well among other commoner

species. We paid another visit on October 8th to the White Holme Reservoir and from the ooze flushed a Common Snipe and another Wader with long, pointed wings, which at first we could not identify. Following the flight of the bird with glasses we saw it eventually settle at the far end of the reservoir. Nearer approach necessitated careful stalking, a difficult proceeding in the soft mud at the margin of the water. We managed however, to get quite close without disturbing it, and after considerable scrutiny and comparison of notes on our return home, with text books, etc., and stuffed specimens in our local museum, were convinced it was a Dotterel (*Charadrius morinellus*). When the bird took flight we particularly noticed the long wings and white undertail and also heard it call. On October 22nd, Mr. Edwards and myself included Withins Reservoir in our route to Blackstone Edge. At Withins we saw a Turnstone in fine plumage. The bird was extraordinarily tame and permitted close approach, finally giving us, as it took flight, a perfect sight of the variegated plumage reminiscent of the Oyster Catcher.

You may remember that the specimen tail of a decomposed Wader, sent you by Mr. Greaves for identification, eventually proved to be that of a Turnstone, and was picked up by Mr. Edwards and myself at the margin of White Holme Reservoir. A further interesting observation is reported by Mr. George Edwards who saw, on November 5th, a fine specimen of a Goldfinch in Cragg Vale, Mytholmroyd. The bird was in the vicinity of an open-air aviary. We visited Cragg Vale again on November 26th and remarkable as it may seem, saw, in practically the same spot where we found the Goldfinch, a fine cock Bullfinch. This bird was also haunting the neighbourhood of this open-air aviary. On our way up the steep road, leading from Cragg Vale to the Withins Reservoir, two Reed Buntings were observed on the same day in company with a flock of Yellow Hammers, and when we eventually arrived at White Holme Reservoir we got a remarkably clear view of a party of six Pochard. During a visit to Hardcastle Craggs, Hebden Bridge, on the 17th December, Mr. Edwards and myself observed at close quarters two fine specimens of Long-tailed Tits. They showed up remarkably well on this bright sunny morning. They are uncommon here.—V. S. Crapnell.

## NORTHERN NEWS.

Prof. A. Gilligan's presidential address to the Yorkshire Geological Society on ' A Contribution to the Geological History of the North Atlantic Region,' and Prof. A. C. Seward's Hamilton's lecture on ' Plant Records of the Rocks ' appear in *The Annual Report of the Smithsonian Institute* for 1932.

# CAUSE OF THE BRITISH QUATERNARY STRAND-LINE OSCILLATIONS.

COSMO JOHNS.
(*Sheffield.*)

THE following is a summary of the results of an investigation of the British Strand-line oscillations as recorded in the pre-glacial, 100 foot and 25 foot raised beaches. It is generally agreed that between the first and second of these episodes the land stood high above the then prevailing sea level and was glaciated, and that there was a re-advance of the ice between the second and third. If these movements are given absolute value by reference to the earth's centre it is possible to express their time relations in a simple bi-axial diagram provided that the nature of the determining movement can be assumed correctly. The isostatic depression of the land by the accumulated ice and lowering of the sea level by the abstraction of water were treated as consequences of the determining movement.

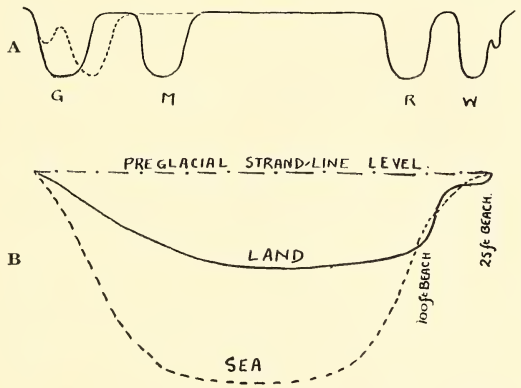


**Fig. 1.**

**A. Climate curve of the Alps (after Penck. The dotted line indicates emendation.**
**B. British raised Beach Curve (C.J.)**

The assumption that the land had risen proved unworkable, but when it was assumed that the sea had suffered a depression, to the extent of at least uncovering the continental shelf, it was possible to obtain a simple diagram that determined the position of the first intersection of the sea and land curves within narrow limits. When this raised beach curve was compared with Penck's 'Climate Curve' for the Alps,[1] using the same time scale, unexpected correlations appeared.

The long British major glacial period could only be equated with the Mindel-Riss interglacial of Penck, while the Riss glaciation appeared to be related to the 100-foot raised beach. There was, however, one anomaly: the Mindel glaciation appeared to be dated too late in Penck's curve. When this was corrected in the light of the trend of opinion[2] among

recent workers on the continent the difficulty disappeared. The two curves are given in Fig. 1.

In view of the unexpected nature of these correlations it became necessary to consider the meteorological factors. Obviously, the Northern Ice field was the dominating influence, with the glacial anticyclone it generated as its active agent, in deflecting the Atlantic cyclone track far to the south of its normal route, which is across Britain and up the Baltic. The Gunz-Mindel, Riss and Wurm-Buhl glaciations of the Alps record the migrations of the storm track as the Northern Ice field advanced or retreated. It is a reasonable inference that the deflections which occurred during the Mindel-Riss and the Riss-Wurm interglacials are represented by deposits indicating increased precipitation south, and possibly east, of the Mediterranean. To meteorologists the mirror image aspect of the Gunz-Mindel glaciation, in the emended climate curve of Penck, when contrasted with the Wurm-Buhl, may be significant in view of the difference in the direction of approach of the Atlantic cyclonic storm belt during these two episodes. These movements are indicated in Fig. 2.

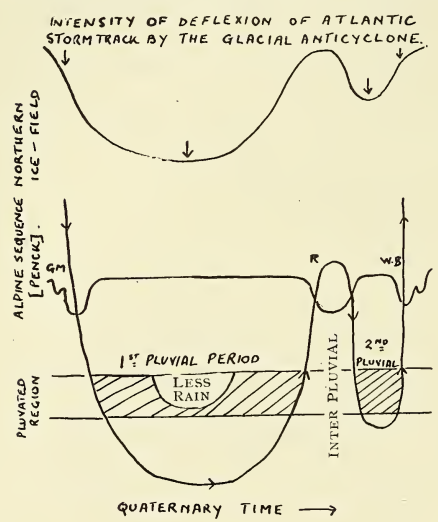


**Fig. 2.**

**Diagrammatic sketch of the direction of migration of the Atlantic Cyclone track during Quaternary time.**

The results obtained are tabulated in the following correlation table. The relative time intervals are approximate only.

The most significant feature of the table is that the Alps and N.W. Europe appear in the definite relation of positive and negative. As a working hypothesis the correlations, unexpected though they may be, should not be unwelcome. It may serve to explain the inability of so many workers to reach even approximate agreement in their efforts to recognise Penck's Alpine episodes in the glacial deposits of N.W. Europe, including the British Isles. These difficulties have been well described by Gregory[3] and Boswell.[4] Two curves, or frames of reference, are now available. Penck's classical 'Climate curve,' as emended, stands for all deposits that can be related

to the Alpine sequence, while the new raised beach curve, which might be referred to as the Quarternery Ocean Depression hypothesis, is available for N.W. Europe and the British Isles in a form that invites a rigorous test of its validity. It is

**CORRELATION TABLE.**

| | | | | | |
|---|---|---|---|---|---|
| Scandinavia | Major Glaciation | | Yoldia Sea | Re-advance of Ice | L'it-torina Sea |
| British Isles | Cromer F. B. | Major Glaciation | 100 ft. Beach 100′-140′ Thames Terrace | Re-advance of Ice | 25 ft. Beach |
| Alps | Gunz — Mindel | Inter-Glacial | Riss | Inter Glacial | Wurm — Buhl |
| North Africa [?] | Arid | First Pluvial Period (Less Rain) | Arid Inter-Pluvial | Second Pluvial | Arid |

hoped to publish a full account of the investigation at an early date.

References.


1 Penck and Bruckner, *Die Alpen im Eiszeitalter*, p. 1168.
2 C. F. Solch, *Report British Association*, 1930, p. 379.
3 Gregory, *Report British Association*, 1930, pp. 376-8.
4 Boswell, *Report British Association*, 1932, p. 57 *et seq.*


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At a recent meeting of the Geological Society of London, S. R. Nockolds read a paper on ' The Contaminated Tonalites of Loch Awe, Argyll.

Doncaster Art Gallery and Museum Committee have recommended the appointment of Mr. Norman Smedley as curator at the Beechfield Museum in succession to Mr. W. C. Sprunt, who has taken a similar post at Warrington. Mr. Smedley graduated at Cambridge University, and was for some years curator at Raffles Museum, Singapore. He is a member of the Marine Biological Society and the Challenger Society, and holds the diploma of the Museums Association. He is 33.

The annual meeting of the British Association will be held next year at Aberdeen from September 5th to 12th, under the presidency of Sir William Hardy, F.R.S. The following sectional presidents have been appointed : Mathematical and Physical Sciences, Prof. H. M. Macdonald, F.R.S. ; Chemistry, Prof. T. M. Lowry, F.R.S. ; Geology, Prof. W. T. Gordon ; Zoology, Dr. E. S. Russell ; Geography, Prof. A. G. Ogilvie ; Economic Science and Statistics, Prof. H. M. Hallsworth ; Engineering, Prof. F. G. Baily ; Anthropology, Capt. T. A. Joyce ; Physiology, Prof. H. E. Roaf ; Psychology, Dr. Shepherd Dawson ; Botany, Prof. A. W. Borthwick ; Educational Science, Mr. H. T. Tizard, F.R.S. ; Agriculture, Prof. J. A. S. Watson. The President of the Conference of delegates of corresponding societies will be Col. Sir Henry Lyons, F.R.S.

## In Memoriam.

C. F. TETLEY.

NATURALISTS, in common with other Yorkshiremen, suffered a severe loss in the death of Mr. C. F. Tetley on January 25th. Mr. Tetley had long been a member of the Yorkshire Naturalists' Union and of the Leeds Naturalists' Club, although his many public activities and advanced age severely limited his participation in the work of these societies.

Born in 1848, and educated at the Leeds Grammar School, Mr. Tetley will long be remembered both for his unusual share in the public life of Leeds and for his generosity. At the time of his death he was the senior magistrate of the city and a member of the West Riding Bench. He succeeded Lord Airedale as the Lord Mayor of Leeds when the borough first became a city in 1897, and on the occasion of the Leeds Tercentenary celebrations in 1927 he was made an honorary freeman of the city in recognition of his great services. For more than half a century he had been a member of Council of the Yorkshire College and the University of Leeds. He had subscribed liberally, in time and money, towards the development of the University, and when his son, Col. C. H. Tetley, D.S.O., was elected Pro-Chancellor in 1926, the University conferred on Mr. Tetley the honorary degree of Doctor of Laws.

Mr. Tetley was a leading churchman, and it is well known that his practical sympathy with the poor and sick was not limited to his very large gifts for charitable purposes. It has truly been said of him that he was a man who tried to live up to his own high ideals of citizenship and of public service.

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## FROM A MICROSCOPIST'S NOTE BOOK.

W. LAWRENCE SCHROEDER.

SOME phantom larvæ—*Corethra plumicornis*—taken about the middle of one November, from a pond in Shibden Valley, were, in the mid-May of the following year, well and active. All through the winter they seemed to feed not at all ; when, from time to time, I put one and another under the microscope, the stomachs were empty. But with the warmer weather, appetite seemed to revive and early in the May several had snapped down some of the minute crustacea which were in the jar. From then on, life was normal.

*Spirogyra* is an alga that worries me somewhat. At times it will maintain its well-being in the jar, and flourish in a delicate lady-like fashion. But more often the chloroplasts degenerate, the filaments break up, and the cells empty themselves—within an unreasonably short time : and the

jar goes foul. In one such case, the *Cyclops* multiplied exceedingly. Thinking to save the contents of the jar, I aerated the water with a bulb-pipette. In a minute or so, the whole body of the *Cyclops* rose to the surface, and remained —half an inch deep—fairly quiet : there was scarcely one in the lower water of the jar. Occasionally, I have left the *Spirogyra* in dishes, and to advantage : it would seem as if the wider air-surface were essential to the health of the filaments.

In one of my bell-jars, a number of snails—of the *Lymnæidæ*—became infested with *Chætogaster vermicularis*, an oligochæte of the Naidomorpha family. There were free individuals also among the duckweed—*Lemna minor* : and there were also numbers of another oligochæte—*Nais serpentina* on or about the snails.

I made drawings of the Chætogaster on May 16th. I took it from the respiratory chamber of a *Limnæa stagnalis*, which had been an inmate of the jar for about two years. The worm was in process of division : on the following day, the younger end divided again, so there was a chain of three. The Chætogaster is a commensal rather than a parasite : for the stomach was crowded with rotifers and some algæ spores The snails did not seem to be inconvenienced by their wormy lodgers ; but who can fathom the mind of a snail !

## TUSK OF ELEPHAS ANTIQUUS.

Some years ago, in examining the cliffs near Bridlington, the

sons of Mr. J. B. Purvis, namely Captain G. B., and the one who is now the Rev. J. S. Purvis, M.A., F.S.A., found a complete fossil elephant tusk. It was in remarkably good condition and measured 3 ft. 8 ins. in length. It proved to be from the straight-tusked elephant, the scientific name of which is *Elephas antiquus*. The specimen has now been presented by the Rev. J. S. Purvis to the Municipal Museum at Hull, where, already, a number of teeth of the same species of animal from Brough are exhibited. He has also presented some remains of Anglo-Saxon date from Kilham in East Yorkshire.—T.S.

The Linnean Society has published the Hooker Lecture entitled ' Some Aspects of the Bearing of Cytology on Taxonomy,' by Professor Sir William Wright Smith. He shows that the taxonomy of the genus *Primula* owes much to cytological as well as to morphological studies.

## NOTES ON MANX LEPIDOPTERA, 1933.

W. S. COWIN.

THE fine, sunny weather experienced in the spring and early summer of this year brought out the first of our commoner butterflies much earlier than usual.

One of the most interesting appearances was that of the SMALL WHITE (*Pieris rapæ*) on March 27th, over three weeks before the date of its usual appearance and eighteen days earlier than I have ever seen it before. This was, doubtless, accounted for by the weather experienced that week, it being continually sunny and the shade temperature reaching 66 deg. F. on this day.

The SMALL TORTOISESHELL (*Vanessa urticæ*) appeared about its usual date, being seen on March 16th.

Most of our other butterflies appeared at much about their usual time, but our two common migrants were recorded unusually early.

The first RED ADMIRAL (*Pyrameis atalanta*) was flying around the cairn on the Mull hill and sunning itself on the rocks on May 21st, while a PAINTED LADY (*Pyrameis cardus*) was seen at the Point of Ayre on May 28th.

The following are the chief features of note among the moths of the island :—

The RUSTIC (*Caradrina taraxaci*) is a new record for the island.

The SPINACH (*Lygris associata*) is now definitely accepted as of regular occurrence. In *The Naturalist* (September, 1929) I recorded the Spinach and suggested that other specimens had possibly been confused with the Northern Spinach (*Lygris populata*) ; the late Mr. P. M. C. Kermode, however, hesitated about accepting this record as the specimen was damaged, but further specimens captured in gardens at Douglas this year have been identified as *associata* beyond doubt.

The early part of September, 1933, was remarkable for the number of HUMMING-BIRD HAWK-MOTHS (*Macroglossa stellatarum*) which appeared in the outskirts of Douglas, where they attracted attention by their habit of hovering over flowers of Red Valerian during the greater part of the day and their powerful flight when alarmed.

Very little has been noted of the Micro-lepidoptera, and the only list of species found in the Isle of Man appears to be those taken by Mr. H. C. Hayward and recorded by him in 1929.

The following three species are additional to his list :—

*Eurrhypara urticata*, extremely common both in gardens in Douglas and in the hedgerows and meadows near by during June and July.

*Scoparia dubitalis*, one specimen taken at Douglas in July.

*Tortrix fosterana*, abundant in gardens near Douglas, where it can be beaten from ivy in dozens during mid-summer.

# THE ATLANTEAN CONTINENT—A PROTEST.

The reviewer in last month's *Naturalist* shows a regrettable levity in treatment of a great scientific problem. Ignoring the mass of evidence called from the works of eminent geologists from Lyell to the present day, he says, ' According to Mr. Forrest successive generations of glacial geologists since Louis Agassiz have been pursuing a will-of-the-wisp.' I have never said anything of the kind. On the contrary, my own work could never have been written had it not been for the splendid labours of those same glacialists. For nearly a century they have been seeking a clue to the solution of the Great Ice Age mystery. Unfortunately, they failed to find it. At the British Association Bristol meeting, I heard an eminent professor say that we were as far off as ever from determining whether there were several ice-ages, or only one. I suggest that the reason for this failure was that glacialists did not look far enough afield : they concentrated overmuch on local phenomena.

That the Ice Age might have been caused by elevated land in the north is no new idea. Lyell hinted at it, G. F. Wright put it more plainly still when he wrote (*Man and Glacial Period*, 113), ' The predominant cause of the Glacial Period was probably a late Tertiary or post-Tertiary elevation of the northern part of the continents, accompanied with a subsidence in the central portion.' My hypothesis is very similar. It is based on the stupendous fact that the N. Atlantic bed has sunk *over* 12,000 feet. This is no theory. It is proved by the formation of the Bermudas—coral islands which rise pillar-like from this immense depth. As the coral-builders cannot exist below 40 fathoms, this spot must have been near the surface when they began building. If it has sunk 12,000 feet the converse must be true—that originally it stood that much higher. The conditions can be reconstructed by raising the ocean floor 12,000 feet between the Continental shelves only : Europe and America did not share in the subsidence. Result : The Atlantean Continent with highest point 17,000 feet in Iceland.

If this subsidence can be disproved, my book is wrong. On the other hand, if it be admitted, we have here the true solution of the following, among other, problems : (1) The Cause of the Ice Age ; (2) The Cause of Movement of the Ice Sheet ; no other book explains this ; (3) The production of Drumlins and Kettleholes, and why they are confined to a belt along the southern boundary of the Ice Sheet ; (4) The reason for crossing lines of Striæ and boulder-carry in certain regions ; (5) The change of direction of ice-movement in the North Sea ; (6) The reason why animals of a cold and warm fauna (such as Reindeer and Hippopotamus) are found together in the Thames Valley, etc.

Surely a work which affords a rational explanation of all these problems cannot be mistaken?

H. Edward Forrest.

Mr. Forrest's claim for a North Atlantic Continent in Pleistocene times cannot be allowed. There is no proof that the coral capping of the Bermudas extends down to 12,000 feet ; Marine Pliocene rocks occur in Iceland ; Pre-glacial beaches are found at several places in Britain ; Derived Marine non-Arctic shells occur commonly in the British Drift. If there was no sea, there could be no sea-cliffs in Donegal and elsewhere to impede the ice sheet, and so, unfortunately, to conceal the crucial evidence. Admittedly, the term ' will-of-the-wisp ' does not appear in the volume, but the dictionary defines it as ' any deluding thing,' and Mr. Forrest would have us believe that the colossal body of evidence that glacial geologists have assembled has simply deluded them while he, using only a fraction of the evidence and very little of more recent data, has reached the true explanation. Yorkshire naturalists can place little reliance on a book which includes the distortions on pages

109 and 110, where the Bielsbeck deposits are described as 'These Kirmington deposits' and where the Sewerby pre-glacial gravels (placed on the N. side of the Humber estuary) are said never to have been buried by the ice sheet. Whence came the Boulder Clay covering them?

THE REVIEWER.

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## SOME NORTH COUNTRY THYSANOPTERA.

W. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H.

DR. R. S. BAGNALL has recently described several new British species of Thysanoptera and as several of these occur in the Northern Counties it has been thought advisable to notice them here. The species described are as follows :—

1928, *Ent. Month. Mag.*, lxiv, pp. 95-99, 130-132, and 153-156, *Odontothrips anthyllidis*, *O. inermis*, *Physothrips flavus*, *P. inæqualis*, and *Baliothrips exilis*, spp. n.

1930, *loc. cit.*, lxvi, pp. 47-50, *Melanothrips harrisoni*, sp. n.

1932, *loc. cit.*, lxviii, pp. 161-165, *Æolothrips anthyllidis*, *Dendrothrips peucedani*, *Haplothrips marrubiicola*, *H. senecionis*, and *H. juncicola*, spp. n.

*Odontothrips anthyllidis* Bagn. on *Anthyllis vulneraria*. Described from Aberdeen, Bedfordshire, Surrey, and Speeton, Yorkshire.

*O. inermis* Bagn. Described on a male from gorse at Delamere, Cheshire, 25-viii-1925 (H. Britten).

*Physothrips flavus* Bagn. on *Epilobium angustifolium*, a male at Delamere and a female at Winlaton, Co. Durham.

*P. inæqualis* Bagn. on *Tamus communis* at Tadcaster, Yorkshire, two females, vi-1920 (R.S.B.).

*Baliothrips exilis* Bagn. on *Holcus lanatus* at Burnage Lane, Cheshire, 19-viii-1925 (H. Britten).

*Melanothrips harrisoni* Bagn., a female by beating, possibly off grass in Kent.

*Aeolothrips anthyllidis* Bagn. In Surrey on *Anthyllis vulneraria*. Has also been taken in the Pyrenees.

*Dendrothrips peucedani* Bagn. Kent, both sexes in profusion on *Peucedanum officinale*, one of the rarest British plants.

*Haplothrips marrubiicola* Bagn. Sussex, several found on *Marrubium vulgare*.

*H. Senecionis* Bagn. Common and widely distributed in the heads of *Senecio jacobæa*, especially on the coast.

*H. juncicola* Bagn. Surrey, a male on *Juncus communis*. Other species from the North of England are noted in a paper in the *Ent. Month. Mag.*, lxix, 120-123 (1933) and are : *Bregmatothrips iridis* Watson. Locally common on *Iris pseudacorus* in the South ; apparently rare and very local further north, but recorded from the Midlands, North of England and Scotland.

*Haplothrips angusticornis* Pr., locally common and widely distributed in Britain in the flowers of *Achillea millefolium* and more rarely on *A. ptarmica*. This species is recorded from Derbyshire and Yorkshire, and other parts of the North of England.

*H. juncorum* Bagn. Widely distributed in the South and on the shore, partial to *Scirpus maritimus*, as well as *Juncus*. It has been found on the Lancashire coast.

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The Centenary Volume of the *History of the Berwickshire Naturalists' Club* contains a portrait of George Johnson, M.D., LL.D., Founder and First President of the Berwickshire Naturalists' Club.

## REVIEWS AND BOOK NOTICES.

**Science Progress** for January, 1934, has a long article by **Professor Greenwood** on ' Epidemiology as a Branch of Experimental Biology,' in which is discussed the facts of the ebb and flow of susceptibility to epidemic diseases. Dr. Frank W. Jane writes on ' Aspects of the Study of Wood Anatomy,' and there are a dozen other interesting contributions.

**Birds of the Falkland Islands,** by **Arthur F. Cobb,** pp. 88, Messrs. H. F. and G. Witherby, 46 photographs, price 7/6 net. This is a model but most useful addition to ornithological literature. The author has spent a number of years in the Falkland Islands and has evidently had much opportunity for bird-watching, which has been carried out with skill and care. Readable detailed descriptions of about thirty species are accompanied by appropriate photographs.

**All About Fish,** by **W. S. Berridge.** 254 pp. with 126 illustrations from photographs by the author. George C. Harrap & Co., 7/6. This interesting and entertaining book is well up to the author's usual high standard. Interest in the natural history of fishes has grown considerably during the past few years and Mr. Berridge's book will be welcomed by naturalists and others seeking a readable accurate survey of the life histories of typical fish. The letterpress is well supported by the fine photographs and the book is cheap at the price.

**Dissection of the Rabbit,** by **R. H. Whitehouse** and **A. J. Grove,** pp. VIII+196, University Tutorial Press, Ltd., price 3/-. It would be difficult to find fault with any part of this excellent and low-priced manual. Although not in the least a cram book, it will prove of the greatest value to the beginner in practical zoology, and is a worthy successor to the companion volume, *The Dissection of the Frog*. The book opens with a few pages of very sound advice to the student, all of which might be read with advantage even by those who have had a year or so at laboratory work. All-metal scalpels are rightly recommended (and even these may be had in rustless steel capable of being sharpened !). Then follows a section entitled ' Preparation,' which gives a clear account of the work to be done in each part of the dissection. The remainder of the book is devoted to detailed instructions and descriptions. The student will be thankful for the clear and accurate line drawings with which the book abounds.

Economic Advisory Council, Committee on Locust Control. **The Locust Outbreak in Africa and Western Asia in 1932,** by **B. P. Uvarov,** Senior Assistant, Imperial Institute of Entomology. H.M. Stationery Office, 1933, price 3s. net. The Committee on Locust Control was formed to investigate the means for mass destruction of the desert locust and other tropical African locusts, and to ascertain reasons of periodic swarming. A general survey reviewed the position from 1925 to the end of 1931, and the present treatise continues the survey. There has been considerable progress in 1932 in extending the area of local surveys. The outbreaks of two species, the desert and the tropical migratory locusts have definitely decreased in intensity during 1932. The desert locust (*Schistocerca gregaria* Forsk) has several more or less independent areas of distribution : Morocco-Senegambia, Algeria-Nigeria, Sudan-Arabia, Somaliland and the Indo-Persian region. Its maximum intensity passed in 1930, and it has been decreasing since. There was a temporary recrudescence in Morocco in 1932. The situation has improved in E. Africa and Asia. The swarms bred in the Mediterranean countries in spring migrate across the Sahara, and eggs are laid during the summer rains. The resulting swarms are adult in September and October, and migrate back to the north where the spring generation

breeds. The tropical migratory locust (*Locusta migratoria migratorioides* R. and F.) inhabits Nigeria, Sudan, Uganda, Kenya, Tanganyika and Northern Rhodesia. In East Africa the peak of outbreak was reached with the nineth generation, and in the tenth shewed a definite decrease. The flights spread to S. and S.W. into a region of different climate. They arrived well after the onset of the dry period and did not reach sexual maturity with practically no breeding. This great exodus from East Africa was not, as usual, along lines of increasing humidity, but due to influence of winds. The red locust (*Nomadacris septemfasciata* Serv.) has gradually increased from a small swarm in 1927, found in N. Rhodesia to the sixth generation in 1932. It has spread to Transvaal, Natal and the Congo, and has a single breeding period in the rainy season. Details are given of an incipient outbreak of the Bombay locust (*Patanga succincta* L.) in the Malay States. Twelve pages of bibliography conclude the work.—W.J.F.

**Virus Diseases of Plants,** by **S. Grainger.** 102 pp. Oxford University Press, 6/- net. Considering how rapidly the study of the virus diseases of plants has proceeded of recent years, it is surprising that there are so few easily accessible and readable accounts of this subject. Dr. Grainger's little book thus fills a very real need, and it makes available to the student, at small cost, the general principles and the technique upon which our knowledge of the filtrable viruses is based. Illustrations are based upon a representative number of typical examples of virus disease and an exhaustive description of the various virus diseases is not attempted. Methods of filtration, measures of control, and the relation of insects to virus diseases are given in adequate detail to indicate the various practical points which arise in considering these problems. The book may be recommended to the general mycologist as well as to the student. While the full citation of references is probably unnecessary in a book of this size and type, it certainly gives the serious worker the advantage of a reasonably full bibliography in a handy form.

**Science, Philosophy and Religion,** by **W. Lawrence Schroeder.** 64 pp. The Lindsey Press, 1/-. Readers of this journal will welcome this addition to the series on ' Religion : its modern needs and problems,' from the able pen of one of our contributors. It deals with the relation between science, philosophy and religion, and well maintains the high standard of this series. The development of scientific and philosophical thought is very clearly traced and the modern positions very clearly stated. Most of the book deals with the methods and definition of scientific and philosophic thought and one may express the opinion that these subjects have rarely been so intelligibly and thoroughly summarised. The intelligent man, who likes to know what is going on in rarer atmospheres than his own, will find this a useful companion in its own field to such books as Jeans' *Riddle of the Universe.* We wish, indeed, that the author had deserted his brief (and expanded his volume) to discuss the problems raised by recent physical work and their bearing on the outlook of science. The purely mechanistic science of the latter half of the nineteenth century seems to be doomed beyond question, for we know now that our ultimate particles of ' matter ' do not all do the same thing at the same time, but appear to have what we can only call ' individualities ' of their own. Here, it seems, we are reaching scientific facts which justify the philosophical outlook. We can only wish also that the author had expanded the penultimate chapter dealing (very briefly) with religion in relation to science and philosophy. It seems possible that there is scope for the treatment of religion in a developmental way, so successfully carried out in relation to science and philosophy. We may, perhaps, hope that Mr. Schroeder will expand his theme in another volume.

## NEWS FROM THE MAGAZINES.

*The Durham University Journal* for December has notes on 'The Weather in Upper Teesdale, 1933,' by G. Manley.

*Ours*, the magazine of Reckitts, for December, contains a well-illustrated report of a lecture by T. Sheppard, on 'Collecting Museums.'

*The Australian Museum Magazine*, Vol. V, No. 4, has an account of 'The Oldest Human Implements and Their Discoverer,' with photograph of the late Benjamin Harrison, of Kent, of 'Eolith' fame.

The Recorders of the Lancashire and Cheshire Fauna Committee have issued their *Nineteenth Report*, which contains the various observations on the birds, sawflies, spiders, galls, and insects made during 1932.

*The Sixty-third Annual Report of the Libraries, Art Gallery and Museums Committee of Bradford* records an important collection of nearly 200 water-colour drawings of British flowering plants, which has been presented to the Museum by the artist, Miss Lucy E. Beedham.

*The Monthly Report of the Council for the Preservation of Rural England* for December contains a record of much interest to northern naturalists, including a report of the Wild Plant Conservation Board meeting held in London recently, at which Mr. T. Sheppard was present as representing the Yorkshire Naturalists' Union.

The recently issued volume of the *Surrey Archæological Collections* has three papers of interest to northern archæologists, namely, 'The Pigmy Flint Industries of Surrey,' by W. Hooper; 'Dry Hill Camp, Lingfield,' by S. E. Winbolt and I. D. Margary; and 'Bronze-Iron Age and Roman Finds at Ashtead,' by A. W. G. Lowther.

*The Fifty-fifth Annual Report of the Committee of the Public Libraries and Museum of St. Helens* informs us that the four rooms used as a museum are so full that there is very little space which can be used for additions. The provision of the large new show-case last year has given a little extra space, and this has been used to display some interesting specimens lent by the Trustees of the Lady Lever Art Gallery, Port Sunlight.

Papers or notes of interest to northern geologists have appeared in recent journals. In *The Museums Journal* for December Mr. E. Hendy refers to 'Cellulose Films of Fossil Plants from Coal Balls.' In *Geography* for December Mr. E. Clucas Sykes has an illustrated account of 'The Agricultural Geography of Northumberland.' In *The Quarterly Journal of the Geological Society*, No. 356, Mr. V. Wilson gives a description of 'The Corallian Rocks of the Howardian Hills.'

*The Entomologists' Record* for December contains 'The Annual Exhibition of the South London Entomological Society,' by H. J. Turner; '*Cis quadridentulus* (Col), a species new to Britain,' by H. Donisthorpe (one specimen on dried fungus in beech, Windsor Forest); 'Myrmethogynes,' by J. H. Taylor; 'Supplement. British Noctuae,' by H. J. Turner; and various collecting notes, including one on the beetle, *Denops albofasciatus* Charp., new to Britain, from Putney.

*The Entomologist* for December contains '*Phlyctenia fulvalis* and *Crambus contaminellus* in Southern England,' by J. C. F. Fryer; 'Migration Records,' by Capt. T. Dannreuther; 'Holarctic Butterflies: Miscellaneous Notes on Nomenclature,' by F. Hemming; 'A New Hispine Beetle injurious to Coco-nut,' by S. Maulik; 'A Small Collection of British Trichoptera,' by M. G. Moseley, and numerous short notes and observations, mainly concerned with double-broodedness in Lepidoptera.

*The Twelfth Annual Report of the Secretary for Mines* and the *Twenty-fifth Annual Report of H.M. Chief Inspector of Mines* for the year ending December 31st, 1932 (H.M. Stationery Office, 3/6) gives the usual review of all aspects of mining and quarrying in Great Britain. There are about 120 pages of statistics which show, among other things, that in 1932

Yorkshire produced the greatest value in minerals, that 3,000 tons of alum shale were produced in the county, and that the Cleveland ironstone is being replaced by ores from Lincolnshire, Northants, and Leicester.

R. G. Collingwood gives 'An Introduction to the Prehistory of Cumberland, Westmorland and Lancashire North of the Sands,' and 'Prehistoric Settlements near Crosby Ravensworth,' in the *Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society*, Volume XXXIII.

*The Report of the Committee of the Public Museums and Art Gallery of Belfast* is probably unique in the large size of its pages, two of which are devoted to copies of remarks by visitors made in a book provided for the purpose. These include such items as: 'A most interesting place and well worth seeing several times'; 'Delighted with everything'; 'Very interesting indeed'; 'Full of interest and well organised'; 'A very interesting prehistoric collection'; 'A new world'; and 'A wonderful gallery—pictures well arranged.'

In *Buxton Public Libraries Book-List*, No. 9, Lady Boyd Dawkins writes on 'Prehistoric Man.' She concludes by a quotation from her late husband, Sir William Boyd Dawkins, written when he was in his 91st year: 'When we realise the vast antiquity of man we can only wonder at the slowness of his progress, but it has been steady and on an ascending plane. We may therefore accept the view that mankind is "One Man, always living and incessantly learning," and look forward with confidence to his future.'

*The Lincolnshire Magazine* for November-December contains illustrations of river Crayfish from a brook near Grantham, Lincolnshire. It will be remembered that so long ago as November, 1914, Mr. Sheppard described a publication dated 1731, in which it was recorded that 'Sr Christopher Medcalfe brought Crey-fish from the South parts of England' and stocked a pool—Semur (Semmer Water)—with them. Specimens still occur in Semmer Water, and are probably survivals of this early experiment, and it seems more than possible that others may have been introduced into Lincolnshire at the same time.

*The Entomologists' Monthly Magazine* for December contains 'New Species and Descriptions of Larvæ of Lymantriidæ from Uganda,' by C. L. Collinette and G. D. Hale Carpenter; '*Atheta* (*Datomicra*) *oloriphila*, a Staphylinid Beetle new to Science' (from Windsor Forest), by J. H. Keys; 'Five New Species of Diptera' (with plate) (*Chriomyia inermis, Lauxania simillima, Camilla fuscipes, C. nigrifrons* and *C. subfuscipes*), by J. E. Collin; '*Cephus nigrinus* Thoms., an Addition to the British List of Hymenoptera' (from Warwickshire), by J. W. Saunt; and '*Arundo donax* and its Insect Guests,' by J. A. Simes.

*Journal of the Entomological Society of the South of England*, Vol. I, Part 4, 1933. This part is packed with interesting and important more or less short notes on entomology to the number of forty-six. It is rather difficult to select a few for special notice, but among others may be mentioned 'Some records of Odonata, Ephemeroptera, Plecoptera, Neuroptra and Trichoptera in Devonshire,' and the same (without Neuroptera) from Inverness-shire, by W. E. Kimmins; 'Some Data relating to Scottish Chrysopidæ,' by K. J. Morton; 'Aberrations of British Rhopalocera taken during 1933,' by S. G. Castle Russell; and 'Prey of *Scatophaga stercoraria* L.,' by B. M. Hobby, which are the five longest papers. Among the short notes may be mentioned those on a new British midge, *Diamesa galactoptera*, new from Bagley Wood; *Diprion polytomum* Htg., a new sawfly from Hampshire; a few notes on hymenopterous and dipterous parasites and predaceous insects; the rare dipteron, *Volucella inflata* L., in scores on *Pyrus aria* at Farley Downs; the dipteron *Sphegina clunipes* Fln. in an apparent mimetic association with certian hymenoptera; insects visiting orchids; the prey of Thomisid spiders; and albinism in *Epinephele janira* (with plate).

Apparatus and Lantern-Slides
for the
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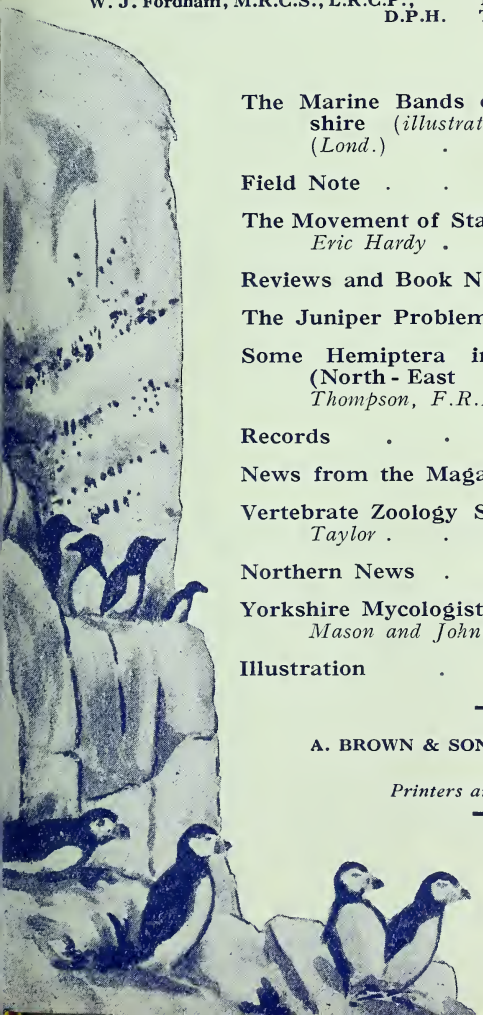

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# THE MARINE BANDS OF HEYDEN CLOUGH, DERBYSHIRE.

JAMES WALTON, B.Sc. (LOND.)
(*Leeds University.*)

HEYDEN BROOK rises on Black Hill and drains southwards into Longdendale, where it enters the Woodhead Reservoir at Woodhead. In its course it exposes the whole of the R.2 zone, and although slipping has taken place in some instances it has not disturbed the sequence very much.

## PALÆONTOLOGICAL DETAILS.

### The *Reticuloceras reticulatum* mut. α Subzone.

The mut. α band is represented by black shales resting on the Kinderscout Grit and outcropping on the west bank of the stream one hundred yards south of the confluence with Stable Clough. The dominant fossils are *Reticuloceras reticulatum* (Phillips) mut. α Bisat, *Pterinopecten speciosus* J. W. Jackson and *Posidoniella minor* (Brown), and the following is a full list of fossils collected :

*Reticuloceras reticulatum* (Phillips) mut. α Bisat.
*Dimorphoceras* sp.
*Pterinopecten speciosus* J. W. Jackson.
*P.* aff. *speciosus* J. W. Jackson.
*P.* cf. *speciosus* J. W. Jackson.
*Posidoniella minor* (Brown).
*P.* cf. *minor* (Brown).
*P. rugata* J. W. Jackson.
*P.* sp.

### The *Reticuloceras reticulatum* mut. β Subzone.

Around Huddersfield this subzone is represented by three definite bands which are characterised by forms referred to as early mut. β, mut. β, and late mut. β.[1] In the area under consideration there is no such definite subdivision and all the forms are found in one thick band which is exposed continuously for about 300 yards, starting at the junction of Heyden Brook with a small stream from the west and continuing southwards to a point about sixty yards north of the confluence of Heyden Clough and Stable Clough. The basal part of the band, which is separated from the Readycon Dean Series by several feet of shale, is exposed on the west bank and yielded :

*Reticuloceras reticulatum* (Phillips) mut. β Bisat.
*R. reticulatum* (Phillips) early mut. β Bisat.
*R. reticulatum* (Phillips) late mut. β Bisat.



APR 7 1934

*Homoceras proteum* (Brown).
*Pterinopecten speciosus* J. W. Jackson.
*Posidoniella minor* (Brown).
*P.* cf. *minor* (Brown).
*P.* cf. *rugata* J. W. Jackson.
*P.* sp.

This bed is characterised by mut. $\beta$ and early mut. $\beta$ but it passes upwards into a bed containing hard calcareous bullions in which late mut. $\beta$ is dominant but is accompanied by the other forms. This band is exposed in the east bank,

| | *Mut.* $\alpha$ *Band.* | *Mut.* $\beta$ *Band.* | | | *Dimorphoceras Band.* | *Mut.* $\gamma$ *Band.* |
|---|---|---|---|---|---|---|
| | | *Base.* | *Middle.* | *Top.* | | |
| *Reticuloceras reticulatum* (Phillips) | | | | | | |
| Mut. $\alpha$ Bisat. | 10 | | | | | |
| Late mut. $\alpha$ Bisat. | | 1 | | | | |
| Early mut. $\beta$ Bisat. | | 1 | 2 | | | |
| Mut. $\beta$ Bisat. | | 6 | 6 | | | |
| Late mut. $\beta$ Bisat. | | | 7 | 10 | | |
| Mut. $\gamma$ Bisat. | | | | | | 10 |
| *Dimorphoceras* sp. | 6 | | 4 | | 6 | |
| *Homoceras proteum* (Brown) | | 4 | | 10 | | |
| *Homoceratoides divaricatum* (Hind) | | | | | | 3 |

Fig. 1.—Distribution of Goniatites in Heyden Clough Marine Bands. 1-2=very rare, 3-4=fairly rare, 6-7=fairly common, 8-10=very common.

forty yards north of the previous locality, and the following fossils were collected :

*Reticuloceras reticulatum* (Phillips) early mut. $\beta$ Bisat.
*R. reticulatum* (Phillips) mut. $\beta$ Bisat.
*R. reticulatum* (Phillips) late mut. $\beta$ Bisat.
*Dimorphoceras* sp.
*Posidoniella minor* (Brown).

The bullions contain uncrushed goniatites, and the Survey have pointed out that their hollow chambers are usually filled with petroleum.[2] These goniatites are all *Reticuloceras reticulatum* (Phillips) late mut. $\beta$ Bisat but on sectioning them they are found to show considerable variation in the nature of their septa. In the small forms (Fig. 3c) the septa are widely separated and straight whereas in the larger forms

(Fig. 3e) they are close together and are curved in order to accommodate themselves to the curvature of the whorls.

The uppermost part of the bed, which outcrops on the west bank fifty yards upstream, yields late mut. $\beta$ and *Homoceras proteum* (Brown), both of which are very plentiful, together with *Posidoniella* cf. *minor* (Brown).

The value of the subdivisions of the mut. $\beta$ subzone seems to be only slight in this area and at Howels Head, a little to the north-west of Heyden, late mut. $\beta$ occurs where early mut. $\beta$ would be expected. As a result of this the Survey conclude that the subdivisions of mut. $\beta$ do not form a time sequence.[3]

Although there is considerable overlap it will be seen from the accompanying distribution frequencies that at Heyden

| | *Mut.* $\alpha$ *Band.* | *Mut.* $\beta$ *Band.* | | | *Mut.* $\gamma$ *Band.* |
|---|---|---|---|---|---|
| | | *Base.* | *Middle.* | *Top.* | |
| *Pterinopecten speciosus* J. W. Jackson | 10 | 6 | | | |
| *Posidoniella minor* (Brown) | 8 | 4 | 3 | 3 | 4 |
| *P. rugata* J. W. Jackson | 2 | 3 | | | 1 |
| *P. laevis* J. W. Jackson | | | | | 3 |

Fig. 2.—Distribution of Lamellibranchs in Heyden Clough Marine Bands. 1-2=very rare, 3-4=fairly rare, 6-7=fairly common, 8-10=very common.

there is a gradual passage from early mut. $\beta$, through mut. $\beta$, to late mut. $\beta$ (Fig. 1.).

### The *Dimorphoceras* Band.

In the shales underlying the Heyden Rock a band occurs containing *Dimorphoceras* sp. In addition a specimen of *Sphenopteris* sp. was obtained.

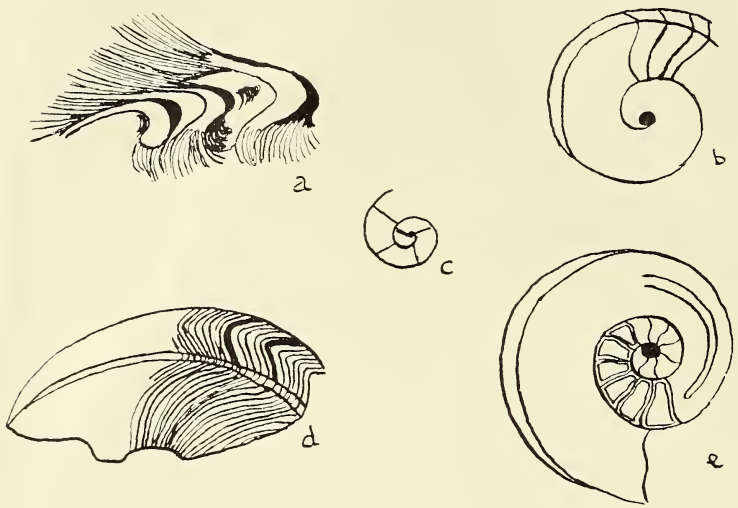
### The *Reticuloceras reticulatum* mut. $\gamma$ Subzone.

The mut. $\gamma$ band outcrops at Heyden Head on the east bank just below the junction of the two headstreams and it rests on a bed of sandstone thirty feet above the top of the Heyden Rock.[4] It is very fossiliferous and yielded :

*Reticuloceras reticulatum* (Phillips) mut. $\gamma$ Bisat.
*Dimorphoceras* sp.
*Homoceratoides divaricatum* (Hind).
*Posidoniella laevis* (Brown).
*P.* cf. *minor* (Brown).
*P. rugata* J. W. Jackson.

Conditions of Deposition in R.2 Time in Heyden Clough.

It has been pointed out above that in Heyden Clough there is no subdivision of the mut. $\beta$ band and this suggests




Description of Fig. 3.

Goniatites from Heyden Clough Marine Bands :

(*a*) Lingua of adult *Reticuloceras reticulatum* (Phillips) mut. $\alpha$ Bisat, x2. Horizon : Mut. $\alpha$ band.

(*b*) *Dimorphoceras* sp., x2. Horizon : *Dimorphoceras* band.

(*c*) Section of *Reticuloceras reticulatum* (Phillips) late mut. $\beta$ Bisat. Small form showing widely separated septa, x2. Horizon : Middle of mut. $\beta$ band.

(*d*) *Reticuloceras reticulatum* (Phillips) late mut. $\beta$ Bisat. Large form showing ornamentation, x2. Horizon : Middle of mut. $\beta$ band.

(*e*) Large form of *Reticuloceras reticulatum* (Phillips) late mut. $\beta$ Bisat, sectioned to show closely arranged septa as compared with the small form, x2. Horizon : Middle of mut. $\beta$ band.

that these subdivisions do not represent a time sequence. If, however, we consider the conditions applying during this period we see that an overlap of forms does not necessarily imply that the forms were contemporaneous. At the end of the Kinderscout Grit deposition there was a marine transgression characterised by mut. $\alpha$. This was followed by a further deposition of mud and sand and in this area there was no encroaching of the sea in early mut. $\beta$ times. After the

Readycon Dean Series and the overlying shale had been formed there was a second marine period which extended throughout mut. $\beta$. times and showed no periodicity as is observable in the area to the north.

In the earlier stage the existing form was mainly mut. $\beta$ and this persisted up the middle of the band when late mut. $\beta$ appeared. When these animals died they would sink into the still unconsolidated bed containing mut. $\beta$ and in consequence a mixed fauna results. During this latter period the water was heavily charged with calcium carbonate, and the specimens of late mut. $\beta$ were not only preserved from solution but they were also preserved in the calcareous bullions. In this way we get a bed of shale containing crushed specimens of mut. $\beta$ and solid specimens of late mut. $\beta$. It is quite obvious that if the specimens of mut. $\beta$ and late mut. $\beta$ in the middle of the band were deposited at the same time they would have been preserved in the same condition, but actually the former are preserved merely as impressions in the shale, whereas the latter are preserved in the bullions in the solid condition and they do not occur as impressions.

As a result then we may conclude that the mixed fauna in this band does not indicate that the various forms were contemporaneous but that the mixture is the result of a mechanical process during deposition. In a future communication it is hoped to discuss various anomalies in the mut. $\beta$ sequence from this point of view.

## Conclusions.

In Heyden Brook the mut. $\alpha$ and mut. $\gamma$ bands are well defined and similar to those in the area to the north [5] but the mut. $\beta$ band cannot be subdivided as in that area although all the forms occur. This is owing to the fact that a mechanical mixture of forms has taken place during deposition.

The form referred to as *Reticuloceras reticulatum* (Phillips) mut. $\beta$ Bisat really represents two distinct forms, one of which is small and has widely separated septa, and a larger form in which the septa are closely arranged. It should be noted that these two varieties have no zonal value.

The position of the $\beta$ plus proteum band is reversed and it occurs above the nodular $\beta$ band whereas in most localities the nodular $\beta$ band is uppermost.[6]

## Acknowledgements.

This short paper could not have been written without the help of Dr. F. L. Kitchin, Dr. C. J. Stubblefield, Mr. W. Dewar, and Mr. C. N. Bromehead, of the Geological Survey, and Mr. W. S. Bisat, to whom I wish to express my sincere

thanks. The specimens were identified by Dr. C. J. Stubblefield, and Mr. W. S. Bisat also examined some of them.

REFERENCES.

1 ' The Geology of the Country Around Huddersfield and Halifax ' (*Mem. Geol. Surv.*), 1930, pp. 146-148.

2 ' The Geology of the Country Around Holmfirth and Glossop ' (*Mem. Geol. Surv.*), 1933, p. 50.

3 *Ibid.* p. 45, 1933.

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6 Bisat, W. S., ' Summ. Prog. for 1931, Pt. ii ' (*Mem. Geol. Surv.*), 1932, p. 120.

## FIELD NOTE.

**Length of the Dive of a Water Hen** (*Gallinulla c. Chlorophus*).—Data given in the literature concerning the dives of water birds are invariably expressed in units of time, since it is obviously impossible on open waters to get other than a very rough idea of the distance travelled under water by a diving bird. In the case to be instanced, however, it was possible to get an exact measure of the distance so travelled by a water hen, and also the period of the dive, the two quantities giving the sub-aquatic speed. The marshes of the Pevensey Level, in Sussex, are intersected by narrow drainage dykes, these often running dead straight for considerable distances. In the case in point, a water hen was disturbed while feeding on the bank of such a dyke. It immediately took to the water and dived. A stick was thrust into the bank at this spot, and the course of the bird's progress under water followed along the bank at a brisk walk. When it finally rose to the surface, the bird was so exhausted as to allow itself to be stroked on the back with the end of a walking stick ; one may thus safely infer that the dive represented the maximum effort of the bird. On carefully measuring the distance traversed, it proved to be $42\frac{2}{3}$ yards. The time taken was 18 seconds, which represents a sub-aquatic speed of $7\frac{1}{9}$ feet a second or, approximately, 5 miles an hour. When one considers that the water hen is by no means an accomplished diver when compared with birds like the Grebes or the diving Ducks, these figures appear impressively large.—STUART SMITH.

The many friends of Mr. S. H. Smith, of York, will be delighted to join with us in congratulating him on his appointment to His Majesty's Roll of the Commission of the Peace. Mr. S. H. Smith is an ex-President of the Vertebrate Section of the Yorkshire Naturalists' Union and has been an active worker in the cause of Natural Science during the whole of his life. He has been President of the York and District Field Naturalists' Section of the Yorkshire Philosophical Society, a member of the Council of the same Society, and an active member of the Yorkshire Fishery Board.

# THE MOVEMENT OF STARLING ROOSTS NEAR LIVERPOOL.

ERIC HARDY.

In view of the agricultural importance of the three hundred odd winter roosts of Starlings (*Sturnus vulgaris* Linnæus) in England and Wales, and obscurity of causes for the movements of these roosts from time to time to fresh localities, one paid particular attention to the movements of a very large roost supplying most of the city of Liverpool and south-eastern border country, the birds flocking in suddenly, using the roost to a maximum capacity for four winters, then leaving as suddenly as they came. The roost was situated in a large wood opposite the club house at the Childwall Golf Club on the south-eastern borders of Liverpool, and birds first began congregating in large numbers in the winter of 1929-1930, when I observed them flighting in the late afternoon from a a northern, N.N.W., north-east, and eastern direction, that is, from the city, but never from a southern or south-eastern direction. The wood consisted of about 100 acres chiefly of elms, with rhododendrons beneath.

The first flights would appear about an hour before dusk, congregating in an outer bunch of trees near the keeper's house, and as the flocks grew in size and these trees could not hold them, they took to the adjoining fields and hedgerows which they soon blackened. Then about dusk they flew into the wood and congregated in the tall trees, and especially fought for position on a large chestnut in the centre, which seemed very popular. After dusk the starlings left the elms for the rhododendrons beneath, presumably for warmth during the night's roosting, as the wood was almost on the top of the southern-eastern side of a hill 200 feet above sea level, which is only about 50 feet below the highest part of south-west Lancashire, and thus the naked elm branches would be much colder for roosting purposes. When the roost was first used, I estimated the birds at 11,000, but later with a visit of the Liverpool Naturalists' Field Club, we estimated it at at least 25,000. Mr. H. N. Coats, Lord Salisbury's land agent, who has the area under his care, later estimated the birds at ' at least two million.' Each succeeding winter the roost seemed more populated until in the winter of 1932-33 every available roosting space seemed occupied. The droppings of the starlings caused considerable damage in poisoning the undergrowth, and Mr. Coats gave me an official estimate of £100 damage done, chiefly to common varieties of rhododendrons. This sum would have been considerable exceeded if rarer varieties had been used by the birds. Each winter, continued efforts were made to drive off the starlings by the

use of blank cartridges, actual shooting with small shot on one occasion, flares, torches, whistles, bugles, smoke, etc., without success.

In the winter of 1932-33 all the beds of common rhododendrons were completely ruined by the birds' droppings, and the gardeners dug them up in the summer of 1933. In the following winter, the starling failed to appear at the usual time towards the end of October and early in November, save for a very few, and by the end of the year only about 2,000 birds, or less, were using the wood. The birds were watched at dusk to make for roosts formed at Cronton, five miles south-east, Whiston, four and a half miles east, and Rainhill, five miles east (to the north-west and north lay Liverpool city, then the Irish Sea). The starlings had apparently vacated the roost in the winter of 1933-34 because in their four years' occupation, they had poisoned the rhododendrons, which, removed in the summer, left them no warmth or shelter for final sleeping room at night. It is interesting that about thirteen years before this Childwall roost commenced, another roost was occupied in a wood in the vicinity and evacuated by the starlings when all the evergreen undergrowth had been poisoned, and in like manner a much smaller roost behind the Red Noses, Wallasey, Cheshire. It appears, therefore, that lack of suitable undergrowth is one of the causes for the periodic movement of starling roosts, particularly shown in this case when all other efforts to move the birds failed until the undergrowth was dug up.

In the last season of the full use of the roost, I obtained a ring from a starling in the area, at Halewood, which Mr. Skovgaard had put on at Strödam, Hilleröd, Sjaelland, near Copenhagen, Denmark, in May. Another ring, from Rossitten, East Prussia, had previously been recovered in the West Derby district of Liverpool.

In some observations I made in a census of birds in Liverpool, for their movements in relation to wind, humidity, temperature, and barometric pressure, in the winter of 1932-33 (*Naturalist*, October, 1933) I was able to make day to day counts during the return migration north of some of the starlings from this roost using a particular birds' sanctuary feeding tables. The starling showed the first falling off in numbers on March 14th, when the temperature had steadily risen from 36° F. on February 23rd, to 49° and continued to rise after. Wind had changed to W.S.W. from E.S.E. after frequently being N.N.W. and W.N.W. in previous weeks. Humidity was slightly lower than average at 77 per cent. and the barometer steady at 30.14. On that day the starlings visiting these tables dropped from 72 to 47, a week later to 21, three days later to 20, and on the 30th to 17 ; by April 4th

they numbered 9, when odd passage birds joined and confused the accuracy of the counts. The birds did not appear in their maximum numbers during the coldest spells of weather, though there was not a great difference, about a fifth to a sixth, between the minimum and maximum, the latter occurring with the temperature five degrees higher than when at minimum count and the wind W.N.W. (the direction of the flocks flying to the roosting place) instead of N.N.W. Numbers still remained comparatively high when the wind blew E.S.E., but were low when it was direct East. Greater or less humidity percentage, or rising or falling barometric pressure corresponded with the slight fluctuations more so than when these were steady. Unfortunately there was very little actual rain during one's observations, and as this was slight when it did occur (4.2 m.m. to 1.2 m.m.) it would be unfair to draw any conclusions. It was interesting that on April 17th, when the last of the winter visitors had gone, migration ceasing, and only the few nesters which remained constant during the summer remained, the barometer had begun to fall after being steady for the previous week, humidity was low at 66 per cent. after being 82 per cent. the previous day, and 77 on the 11th, and the wind, which was W.N.W. the previous day, changed to East, the temperature also having dropped to 51.4° from the previous day's 56.3° F., the 16th being warm and sunny, the 17th cooler and cloudy. After that date, numbers remained constant for they were birds nesting there, though they may have come up in passage.

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## REVIEWS AND BOOK NOTICES.

**Creation's Doom**, by **Desiderius Papp** (translated by H. J. Stenning), pp. 286, Jarrolds Ltd., 12/6. Here is a book which in title, in outlook, in illustrations, and also, it must be admitted, in its loose cover appears to belong to the class of semi-scientific shocker. It is a book which attempts to tell of the future of the earth and of mankind, simply by projecting into the future the main tendencies which have revealed themselves in the past. The author, indeed, claims that he has done little more than press to their logical conclusions the evolutionary ideas with which we interpret the past. On the whole he is justified in his claim. Certain chapters, notably those dealing with astronomical interpretation, and with geological ideas of the development of faunas are really well done. Equally good is the contrast made in another chapter between alarmist ideas that the world may be destroyed by a comet and the records of what actually happened when comets have passed close to planets. The odds appear to favour the planets strongly. The intriguing suggestion is made that insects may become the possible successors of mammals as the dominant animals on earth. The method of approach to this suggestion is quite without offence. There remain a number of speculative interludes which are unworthy of the bulk of the book. The illustrations also show this curious duality of quality. The text figures are good and in keeping with the more

sober part of the text. With one exception the plates appear to bear no relation to the text, and are purely sensational in quality.

**The Coming of Man,** by **R. Broom, F.R.S.,** pp. 238, Witherby, price 10/6 net. This is a well-written account of the problems of evolution with particular reference to the origin of man. The author deals first with theories of evolution as they appear to a zoologist and then to a palæontologist. He discusses the palæontological evidence for the evolution of mammals from the fishes, and then deals with the man-ape, *Australopithecus*. Subsequent chapters describe early types of man and the evolution of modern man. The particular features of the book which will probably prove of most interest, are the description of the Taung's skull about which but little information has been available to the general public. Particularly interesting is the conclusion that the broken bone remains surrounding this skull represent a kitchen midden, for the presence of remains of baboons and of antelopes argues a high degree of intelligence and of activity on the part of the anthropoid which could use them as food. The review of the early geological history of mammals is another useful feature, as are also the suggestions made as to the importance of dolicho—and brachy—cephalic characters in human skulls, and the possible mode in which these characters originated. This is a decidedly useful and an interesting book and it may be recommended to those with anthropological interests. The last chapters of the work deal with the general problems of evolution of mammals in the light of the data for man. The author inclines strongly to the view that psychic influences cannot be disregarded, and he exhibits distinct leanings to the view that evolution in organisms has been controlled by an ' intelligence ' outside the organisms. His treatment of these debatable points is marked by great breadth and never becomes dogmatic. The numerous examples he quotes are distinctly pertinent, and his treatment of evolutionary problems throughout the book will be of great interest to the general biologist.

**Toads and Toad Life,** by **Jean Rostand.** Translated from the French by Joan Fletcher. Messrs. Methuen & Co., Ltd. ; xii+192 pp. with 11 illustrations, price 7/6. Without the slightest attempt to adopt that humanistic point of view which has spoilt many otherwise good natural history books, M. Jean Rostand has managed to produce one of the most fascinating life-histories it has been our good fortune to read. Ask any question you like about toads—and we could all bombard the author with our queries—and you will surely find the answer in this book. The style is most readable, thanks to an efficient translator. We predict a big sale for this book, and not only among naturalists.

**Bird Life in the Isle of Man,** by **Colonel H. W. Madoc.** Messrs. H. F. and G. Witherby ; 200 pp. with 12 plates from photographs, price 6/- net. On reading this book one wishes that every Chief Constable in Great Britain was an ornithologist. No wonder the Chough is actually increasing in the Isle of Man ! This most useful addition to British ornithological literature will be welcomed by all naturalists visiting the Island. All important species are discussed, and with the aid of this manual the visitor should be able to see quite a lot of birds during a short stay. Nesting sites are given in those cases where no harm can be done by the publication of the information.

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*The Geological Magazine* for February is largely devoted to Yorkshire Geology. T. Deans writes on ' The Spherulitic Ironstones of West Yorkshire ' ; C. Johns on ' Significance of the British Quartenary Strand-line Oscillations ' ; and J. Walton on ' The Flora of the Upper Westphalian in Yorkshire.'

## THE JUNIPER PROBLEM.

CHRIS. A. CHEETHAM.

THE Ecological Committee of the Yorkshire Naturalists' Union have drawn attention to the degeneration of the Juniper Scrub on Moughton Scar, they have staked out certain plots there and made a series of careful soil tests in the short time available on the occasion of the field meetings that they have held at this place. At a meeting of this Committee during the Annual Meeting of the Union at Leeds, it was suggested that the subject required much more time and that the whole area, not merely a degenerated portion, should be investigated ; this will involve some fairly strenuous walking that cannot be done on a single day excursion. A convenient time is available this year at Easter as the Union has arranged no meeting at this time. The Committee will make their head-quarters at Austwick. The Juniper question in Teesdale was referred to by Smith and Woodhead in *The Naturalist*, 1910, p. 311, where they refer to F. J. Lewis (*Geographical Journal*, 1904) who stated that Juniper is confined to the exposure of the ' Whinsill ' basalt and dolerite, but they point out that in Britain the plant has a wide distribution as regards geological substrata, and they think the rough conditions found on the basalt are of more moment than the rock content and they suggest that grazing and heather burning are factors to be considered.

At a later Teesdale meeting, reported on p. 215, *The Naturalist*, 1925, Mr. A. Malins Smith suggests that the degeneration is not due to grazing by sheep, although the rabbit may be partly to blame, he thinks the cause may be due to the invasion of ling and to soil changes. In the following volume, p. 274, Mr. J. Norman Frankland, writing with considerable experience with sheep in the Austwick area, states that sheep do eat the young plants and that rabbits do nibble the bark of older plants in hard weather ; he suggests seedlings and young plants are scarce because sheep nibble almost all of these, only the older trees being left, some of these dying a natural death, others being ring-barked by the rabbits, and that bushes in a half-dead condition give the ling a better chance of pushing in around them, but that with the young and vigorous the ling has less chance.

A question of this nature is obviously one that requires help from all branches of field natural history, the soil and rocks involved, the animals and their habits, possible insect and fungal enemies, etc., and the Committee trust that all who can will assist at this meeting at Easter. Early applications for accommodation will help the Secretary to make arrangements at Austwick.

*1934 April 1*

The Juniper area on Moughton is about two miles long and about half a mile in width. It is divided into two portions, the most easterly being in Horton parish, and here the area is divided up between the adjoining farms, this has given the varying farmers, who have so desired, opportunities to attempt clearance for improvement of the grazing. On the west side, the whole area is an open grazing land with stints or rights of feeding varying quantities of sheep belonging to a number of farmers who employ one shepherd for the whole flock ; here there is less chance of individual effort to clear, but here there are rights of shooting belonging to the lord of the manor and consequent attempts to improve cover by gamekeepers to be remembered.

A general view shows that the north-west corner is the oldest and most degenerate, though thirty or forty years ago this was well covered and healthy. Next the central part of the following mass is the most affected, whilst the south-east end shows the youngest and most flourishing plants ; in one corner of this portion there is a very definite boundary due to a wall, though generally the walls have little effect. One noticeable feature is the lack of young plants close to older plants and the wide spacing of the young plants from one another where they occur.

One gathers from conversation with the older farmers, that they think that both juniper, or savin, as they name it, and heather, are both dying off in the district.

## SOME HEMIPTERA IN THE CLEVELAND DISTRICT (NORTH-EAST YORKSHIRE).

M. LAWSON THOMPSON, F.R.E.S.

In the *Proceedings of the Cleveland Naturalists' Field Club* (Vol. IV, Part II, 1932) I published 'a Preliminary List of Cleveland Hemiptera.' As the weather conditions during the past season seemed to be very favourable to the development of these insects, I was able to add to this list a considerable number of species, some of them being very local in their distribution in Yorkshire. With the few exceptions indicated, the following notes refer to observations made in 1933. A few additional localities for species already recorded in the above-mentioned list are included in these notes.

To Messrs. J. Meikle Brown and W. E. China I am very much indebted for their kindness in determining for me many critical specimens—a piece of valuable assistance I am pleased to acknowledge.

HEMIPTERA-HETEROPTERA.

*Temnostethus pusillus* H.S. At Kildale, on oak in June. An additional locality.

*Calocoris alpestris* Mey. Saltburn Wood, on *Stachys sylvatica* in July, 1932.
*Lygus pastiracæ* Fall. Weary Bank Wood, on the banks of the Leven.
*Dicyphus annulatus* Wolff. On the sea-banks at Saltburn, on *Ononis* in July. An additional locality.
*Conostethus salirus* Sahlb. Middlesbrough, in July.
*Macrotylus solitarius* Mey. On *Stachys sylvatica*, near Osmotherley, August, 1931.
*Macrotylus paykulli* Mey. At Saltburn, on *Ononis* in July. An additional locality.
*Harpocera thoracica* Fall. At Kildale, on oak in June.
*Psallus ambiguus* Fall. (*obscurus*, D. and S.). Weary Bank Wood, on the banks of the Leven in July.
*Plagiognathus albipennis* Falls. Common at Middlesbrough, on *Artemisia maritima* in July.

HEMIPTERA-HOMOPTERA.

*Oncopsis* (*Bythoscopus*) *flavicollis* L. At Kildale, on birch, at the end of June.
*Athysanns brevipennis* Kbm. On the moore at Kildale, among grass in June.
*Deetoclphalus flori* Fieb. On the moore at Kildale, in June.
*Deetoclphalus sabulieola* Curt. At roots of the coarse vegetation, on the coast sandhills at Redcar. Very common in September, 1932.
*Deetoclphalus pascuellus* Fall. Middlesbrough, on the river bank, in August. An additional locality.
*Deetoclphalus pulicaris* Fall. On the moor at Kildale, among grass in June. An additional locality.
*Deetoclphalus halophilus* Edw. Middlesbrough, common on *Artemisia maritima* in July.
*Thamnotettix torneellus* Zett. Near Osmotherley, in August, 1931.
*Cicadula frontalis* Scott. Near Osmotherley in August, 1931.
*Eupteryx tenellus* Fall. On the sea-banks at Saltburn, on *Achillæa millifolium*, in July.
*Eupteryx abrotani* Dougl. Common at Middlesbrough, on *Artemisia maritima* in July.
*Delphacodes* (*Delphax*) *pellucida* Fab. Middlesbrough, among grass on the river bank, in August. Both the macropterous and brachypterous forms.
*Delphacodes incinata* Fieb. On the sea-banks at Saltburn, in July.
*Stiroma albomarginata* Curt. On the coast sandhills at Redcar in June.
*Aphalara picta* Zett. On Eston Marshes in August.

## RECORDS.

### YARRELL'S BLENNY NEAR SCARBOROUGH.

On Saturday, February 3rd, 1934, a friend went fishing from the rocks in Burniston Bay, and amongst his catch was a cod weighing between 10 lbs. and 11 lbs. On gutting the fish after arriving home he found in its stomach, besides a small lobster and two edible crabs, a fish which was unknown to him, which he sent on to me for identification. It proved to be a small example of the short-spined Sea Bullhead (*Cottus scorpius*), measuring 5 in. in length, a male, wearing the brilliant red and white livery of the breeding season.

I noticed that the stomach of the fish was greatly distended, and on opening the mouth could see protruding from the gullet the tail of another fish, which I extracted. It proved to be an example of Yarrell's Blenny (*Chirolophis galerita*) exactly the same length as its captor. It was quite entire and coiled neatly into the stomach of the Bullhead with the exception of its tail, for which there was no room.

Yarrell's Blenny is not a common fish in Yorkshire waters. I have met with it twice before, once at Scalby Ness in 1897, and again at Filey Brigg in 1920. These are apparently the only two Yorkshire records known to Travis Jenkins who mentions them in his *Fishes of the British Isles*. In the *Handbook of Yorkshire Vertebrata*, however, a specimen is recorded at Redcar in 1835. I do not know of other records on the Yorkshire coast.—W. J. CLARKE.

### UNSEASONABLE EROTISM IN BIRDS.

The term "unseasonable erotism" was first used by Abel Chapman to denote evidences of sexual activity in animals outside the normal breeding period. Such evidences are common in the literature and are well known to all field observers. In the case of birds, nuptial displays and other evidences of sexual activity may be noted very often during the autumn and winter months; T. A. Coward[1] describes how he watched a male Dartford Warbler (*Sylvia undata dartfordiensis*) displaying to females in the South of France during September and October; Richard Kearton[2] describes the finding of a nest and eggs of the Short-eared Owl (*Asio f. flammeus*) on February 29th during the great vole plague of 1892; while W. H. Hudson[3] found the same bird breeding in South America in mid-winter during a plague of mice. These are examples taken at random from the literature, and no attempt seems to have been made until recently to attach any real significance to such sporadic evidences, these having been formerly attributed to unusual external

circumstances like a sudden excess of food supply or a spell of warm weather.

Recently, however, the French ornithologist, Jacques Delamain [4] has advanced a new and bold postulate that there may exist in many species of birds, a definite sex-life totally unconnected with that required for the sole purposes of reproduction. With a view to finding out more about this theory, M. Delamain was communicated with, and was kind enough to reply fully in a letter, excerpts from which are given below. After pointing out that he bases all his conclusions upon field observations only, and not upon anatomical dissection, M. Delamain says :

' . . . . . In the case of the Little Owl (*Athenen noctua*), a sedentary species, I have seen a pair of these birds effect coition several times in December. It was near Verdun during the war and snow was on the ground. It may be said, of course, that it is known that the Little Owl is a very early breeder, but even in this country, the usual time for laying eggs is the end of March or beginning of April. As regards other species, I can mention the Starling (*Sturnus vulgaris*), which, according to my notes, paired near my home on 11th February.

' My own observations lead me to believe that, with our own sedentary birds at least, sexual activity begins very early, in some cases, in fact, too early to have anything to do with the actual reproduction of the species. With them, the sexual instinct seems to be only slightly dormant, and wakes up temporarily when temperature is mild or food has not been too scarce during winter.

' I know that dissection would no doubt prove that the male and female organs were not yet in a state of readiness, in those early instances of coition. That may be, and perhaps we ought to see in them the result of a mental state, brought about by a vague memory of pleasurable emotion.

' I think it is interesting to note that in both species mentioned, coition took place between individuals of a pair, male and female remaining together all through the winter.

' For migrants, I think that the actual business of migrating stops any premature sexual activity. But even in their case it seems to wake up faintly at times. The other day, at the beginning of October, I saw a Ringed Plover (*Ægialitis h. hiaticula*) display to one of his neighbours, fanning and trailing his tail on the ground, on the beach at Hendaye on the Spanish frontier.

' I am afraid all I have written is lacking in scientific precision. But nature is not simple and does not often fit in with our theories. . . . . '

Whether such an external sex-life as M. Delamain mentions

does, in fact, exist among certain species of birds, remains to be proved, but its possible existence opens up what might well prove to be a very fruitful line of investigation.

Bibliography and References.

[1] T. A. Coward, *Birds of the British Isles*, Vol. III, p. 117.
[2] Richard Kearton, *British Birds' Nests*, p. 254.
[3] W. H. Hudson, *A Naturalist in La Plata*.
[4] Jacques Delamain, *Why Birds Sing*.

STUART SMITH.

## NEWS FROM THE MAGAZINES.

The death is announced of Dr. D. H. Scott, F.R.S., the palæobotanist.

Our contributor, Mr. F. H. Day, gives an admirable ' History of the Carlisle Natural History Society ' in Vol. V of the Society's *Proceedings* just published. This Society commenced as the Carlisle Entomological Society in 1893.

*The Journal of the Ministry of Agriculture*, XL, No. 9, December, 1933, contains among other items the results of Apple Scab Spraying experiments by W. F. Cheal and an article on a Northumberland Hill Farm, by H. C. Pawson.

The papers appearing in the *Proceedings of the Geologists' Association* issued in December, of interest to our readers, are ' Carboniferous Goniatites of the Neighbourhood of Tenby,' by W. S. Bisat ; ' Report of the Summer Field Meeting (1933) to Yorkshire Dales,' by R. G. S. Hudson and Prof. W. B. King ; and ' Report of Field Meeting to Holderness Coast,' by W. S. Bisat.

*The New Phytologist*, XXXII, No. 5, December, 1933, contains articles on ' Sap Pressure and the Movements of Sap,' by W. O. James and H. Baker ; ' The Morphology and Biochemistry of the Pineapple,' by L. E. Holmes ; ' A Study of the Effects of Potassium Deficiency in Beans,' by M. Cattle ; and an article on ' The Theory of Carpel Polymorphism,' by A. C. Joshi and V. S. Rao.

' Vegetable Diseases,' Bulletin No. 68, *Ministry of Agriculture and Fisheries*, 9d. net (H.M. Stationery Office). This is a list of the chief fungal and allied diseases that affect crop plants in this country with references to the original papers containing scientific work on these diseases. The symptoms of the disease are given, the nature of the causative agent and, where possible, the control or remedial measures which are to be advocated.

*The Entomologist* for January contains ' Notes on Two Collections of Butterflies made in Palestine, with a Note on the Occurrence in Transjordan of an Unrecorded Species,' by F. Hemming ; ' British Lepidoptera Collecting, 1933,' by C. G. M. de Worms ; ' Migration Records,' by Capt. D. Dannreuther ; and numerous notes and observations. Among the migration records may be noted *Danaus plexippus* at Nelson, Lancashire, in June (J. Wensley) and *Acherontia atropos* at Blubberhouses, Yorkshire, on June 3rd.

In Volume LXXIV of *Sussex Archæological Collections*, Mrs. L. M. Kensington illustrates a flint implement which had been submitted to Mr. Reginald Smith of the British Museum, and gives his description as follows : ' Most people would call this flint neolithic, and the regular (almost ripple) flaking can be matched in that period, but the form is certainly unusual and a late palæolithic date is not excluded. It is difficult to find an exact parallel, but there should be Aurignac and Solutré specimens on the surface in south-eastern England.'

In *The Museums Journal* for February, under the heading of St.

Helens Fifty-fifth Annual Report of the Committee of the Public Libraries and Museum, we find, ' The four rooms used as a Museum are so full that there is very little space which can be used for additions. Nevertheless, space has been found for specimens of straw marquetry, for two pairs of bellows, a Moorish casket, a polished tortoise-shell, two Canadian moose heads, a suit of armour, and other equally miscellaneous objects lent by the Lady Lever Art Gallery. Why do reputable institutions corrupt their smaller neighbours by such ill-advised loans? '

In the current number of *The Gemmologist*, Dr. L. J. Spencer, F.R.S., Keeper of Minerals, has a note on Sir Hans Sloane's Precious Stone Collection. He says, ' The extensive collections of objects of all kinds which had been accumulated by Sir Hans Sloane (1660-1753) during the seventeenth and eighteenth centuries were acquired by the nation in accordance with his Will and they formed the nucleus of the British Museum in 1753. He was a most energetic collector and cataloguer. The 46 manuscript catalogues written in his own hand contain 79,475 entries and there are also elaborate index volumes written by Dr. Thomas Stack which are dated 1740. The catalogue of " Pretious Stones " extends to 2,256 entries ; " Christalls," 1,868 ; Agate Cups, &c., 303 ; Agate Handles, &c., 239 ; Cameos, &c., 290 ; Engraved Gems, 232 ; Rings, 115. Objects from the Sloane collections are distributed amongst the several Departments of the British Museum at Bloomsbury and the Natural History Museum at South Kensington.'

We learn from *The Quarry and Roadmaking* for February that Prof. W. Pugh, of Manchester University, in the course of a lecture on ' The Geological Aspect of Scenery,' at a meeting in Manchester, described the three great classes of rocks—igneous, sedimentary, and metamorphic —which make the crust of the earth and upon the formations of which the appearance of the earth's surface largely depends. He mentioned in connection with the consolidation of igneous rocks beneath the surface the granitic bosses of Devon and Cornwall, the sheet-like mass of the whin sill in the North of England, and the vertical dikes of igneous rock in Western Scotland. In each case a different formation of the rock had led to a different appearance after erosion. The characteristic sedimentary rocks were sandstones, shales, and limestones. The latter were soluble in carbonated water, and were sometimes traversed by elaborate systems of underground water-courses and caverns, as in Derbyshire and the Mendips.

From the same source that, ' At a recent meeting of the Leeds Thoresby Society, a paper was read by Mr. W. B. Crump describing the pack-horse system of transport of bygone days. Up to two centuries ago, he said, most of the roads across the Pennines were pack-horse roads. The word " road " was a comparatively new one. " Highway " was the name used down to Shakespearean times at any rate, and we still had our highway surveyors. In the North the names of roads in many cases indicated their antiquity. The word " lane," which Leeds claimed as its own, was an old one. Then there was the even more characteristic " gate," which in the North was nearly always a road. There were roads which got their names from the nature of the traffic or the people that used them. Thus there were " badgergates," " jaggergates," " limersgates," and " saltersgate," In the case of old river crossings, one found " wath," meaning " ford." " Brig " in a name nearly always indicated an old bridge and sometimes the latter was called a " hebble." The old pack-horse roads often had a causeway beside them and what was called that to-day was a " cause-way " meaning a bank. Often the old " cause-way " was placed at the approach to a bridge, a low-lying place that was apt to be flooded in winter. The causeway in pack-horse days was placed there for the horses to walk along because of the bad state of the roads alongside.'

## VERTEBRATE ZOOLOGY SECTION MEETING.

A MEETING of the Vertebrate Section was held in the Library of the Church Institute, Leeds, on Saturday, February 17th, and was preceded by a meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee.

The Chair was taken by Mr. Rosse Butterfield and Mr. Sidney Smith exhibited live alevins of the Trout and Salmon which he had successfully hatched after incubation periods of 72 and 73 days respectively.

The delegates nominated to represent the Union at the eighth International Ornithological Congress, to be held at Oxford in July, are Mr. H. B. Booth and Mr. F. H. Edmondson.

Mr. Rosse Butterfield read a paper entitled ' Seasonal Movements of Birds,' and stated that the times of arrival of our overseas migrants had been more fully recorded than the times of departure, and that comparatively little was known of the periodical cross country journeys of certain species. Only a few species of birds are true residents, as the individuals of many species that appear to be resident are continually changing.

The Scotch Grouse is indigenous, strictly residential and able to hold its own throughout the four seasons. The supply of heather, on the tips of which it feeds, ensures an adequate food supply at all seasons, and also the necessary shelter ; it can also rely on suitable food for its young at the proper time. Exceptionally, as after a heavy fall of snow, the Grouse move from the high ground to the valleys in search of food, but there is no incentive for regular migratory movements, and such irregular movements as do take place are related directly or indirectly to the food supply. The great majority of birds are subject to regular or irregular seasonal movements.

The behaviour of the other species that nest on the moors is very different. The adult Cuckoos disappear as soon as the breeding period is over and the movements of the Ring Ousel appear to be related to the successive ripening of wild fruits in autumn, and the time of passage is accelerated or delayed accordingly. It leaves the moors in August when the bilberry crop is exhausted, transfers its attentions to the rowan berries, and crosses over to France in time to feed in the vineyards.

Towards autumn the Twites leave the moors with their families for lower elevations, where they take full advantage of the seed crops and linger for some time. There is, in fact, no apparent reason why the home-bred Twites should leave the country, and further evidence of their winter movements is desirable. As the nights turn colder the Titlarks also leave the moors, and the Merlin, for want of suitable prey, does likewise.

Just as the crops of wild fruits are seasonal so also are the forms of insect life on which birds feed. Certain larvæ make their appearance about the time of arrival of the Willow Wren, and there is reason to believe that the movements of the Lapwing, Redshank, Golden Plover, and Dunlin are similarly co-ordinated to their food supply.

In the lowlands September is the principal month in which to note the movements of certain birds. Linnets, Twites, and Redpolls form flocks and scour the countryside feeding on the seeds of plants ; Bullfinches are attracted by the ripe elderberries, and Warblers appear in gardens. Other birds noted in passage are the Goldfinch, Long-tailed Tits, Stonechat, and Reed Bunting.

By winter most of the summer nesting birds have disappeared and little is known as to when and where they go. Even the familiar birds such as the Song and Missel Thrush are replaced by others of the same species from further north. At times a given area may be almost denuded of its bird life, especially following a heavy fall of snow when possibly

there is a movement to the coast followed by a return as soon as the snow has melted.

Owing to the great difficulty of distinguishing between our native birds and immigrants of the same species it is hardly possible to discover their summer and winter movements without resource to trapping. It is then possible to make a minute examination and to ring a large number of individuals. This method requires a favourable locality and plenty of time as the traps must be visited at short and regular intervals.

Mr. C. F. Procter gave a paper entitled ' Birds of the Estuary,' for which he drew upon observations made over a period of forty-five years spent in the Humber District. During this interval many changes had taken place which intimately affected the movements of birds, and were of considerable interest to the naturalist.

Full tides from the north-east washed down the coast, and considerable erosion of the soft cliffs resulted ; much of this was later deposited around Sunk Island and on the north and east shores of the Humber. Silt was brought down by the River Hull to build up the wide mud flats to the west. Around Sunk Island considerable areas had been reclaimed from the sea, and this process was accelerated by the erection of chalk walls which held back the sea water until most of the suspended matter had been deposited. Later, mud walls were built and vegetation sprang up in an orderly sequence. First green algæ appeared, followed by Glasswort and marine forms of inland plants. Later, Michaelmas Daisies flourished and helped to consolidate the land, which, as it dried, cracked to form creeks with overhanging banks.

Many species of waders are present during the summer months,and their numbers are greatly augmented in the autumn. The Curlew returns in August, and the warning cry of the Redshank is once more marked by the whole bird population. Great flocks of Dunlin appear to perform once more those masterly aerial manœuvres peculiar to the species.

Commencing with the Curlew and Whimbrel one can string together a list of closely related species which steadily diminish in size down to the Stints and Curlew Sandpipers. Certain species such as the Grey and Golden Plover, with a similar winter environment, have come to closely resemble one another, although they are structurally different and only distantly related.

All these species differ in habits ; the Grey Plover haunts the shore while the Golden Plover make frequent inland incursions. Both Curlew and Wigeon dislike long grass, and their movements were much affected last winter by the absence of Irish Store Cattle, which have in other years kept the grass short.

Both the lines and times of flights are much affected by the prevailing tides, and an observant sportsman may do well when less experienced wildfowlers a hundred yards away fail to obtain a shot.

Of the Geese, the Brent is marine in its habits, but the Pink-footed Goose, which was rare sixty years ago, is now plentiful and increasing.

One of the charms of the Humber estuary lies in its very varied bird population, and one may encounter the Peregrine Falcon, Hen Harrier, Common and Rough-legged Buzzard, Grebes, Rails, Ruffs, Godwits, and many other species.

A lively discussion followed the paper, and Mr. Procter was cordially invited to continue his subject at an early date.

Mr. M. Longbottom gave an illustrated paper entitled ' Some Common Yorkshire Birds,' in which he described the results of a long series of patient observations made in Airedale. His object was to endeavour to unravel some of the problems connected with territory in bird life. For this purpose he selected a small circumscribed area of pasture land bounded by hedges and systematically recorded all observations. The site of every nest located was marked on a ground plan, and when successive nests were found they were related as far as possible to a particular

pair of birds. In this way it was hoped to discover how much territory a particular species attempted to control, which species were warned off the area, and which admitted or ignored.

The species dealt with were the common birds of the hedgerow, and as the boys in the neighbourhood regularly found and robbed the nests, every inducement existed for the building of second and third nests.

It is not possible in this report to do justice to the detailed observations which formed the subject matter of this paper, nor could they be understood without reference to the ground plan which linked them together.

During the season seventeen pairs of birds were known to nest in the area ; they consisted of Blackbirds (4), Song Thrushes (3), Robins (3), Willow Warblers (3), Hedge Sparrows (2), Chaffinch (1), and Lesser Redpoll (1), and the known results aggregated only thirteen young birds.

The lecturer was convinced that each male bird seeks instinctively to dominate an area, and that it drives off all intruders of its own species and forces them to move on until they find an unoccupied area which they in turn can dominate. The song of the male bird is itself an assertion of a claim to the territory, and a challenge to all others of the same species.

Mr. J. R. Edwards showed a length of cinematograph film which took the form of a conducted nature ramble of a novel kind. To this end he enlisted the services of Joan, who was initiated into the mysteries of the countryside, and Paddy, her dog, who accompanied her. The picture was not a talkie, and the lecturer ably supplied the missing words and sounds.

All who have themselves hunted for birds' nests must have envied the facility with which Joan, under the lecturer's direction, discovered nest after nest in rapid succession and congratulated themselves on being allowed to accompany such experts in these matters.

The species dealt with were the Great Tit, Missel Thrush, Meadow Pipit, Dipper, Sandpiper, Kingfisher, etc., and the photographs of the latter species in flight and at rest were most realistic.

The film was very well received and the undoubted possibilities of the baby cinema were well exemplified.

Finally, Mr. W. Bennett showed a film of the Sedge Warbler at its nest engaged in feeding and brooding its young. The quality of this film was very remarkable.

Finally a vote of thanks to the lecturers and the lanternist was moved and carried unanimously.

E. Wilfred Taylor.

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The Fourth Annual Meeting of the Association of British Zoologists was held in the Rooms of the Zoological Society of London on January 6th. Dr. J. Gray, F.R.S., was in the Chair, and among the matters discussed were ' Vacation Classes for Teachers of Science in Schools,' by Dr. F. A. Dixey ; ' Recent Developments of Zoological Technique—Drawing Apparatus,' by Messrs. Eltringham, Hewer, Tams, Ford and Canon ; ' The Formation of an Advisory Panel of Zoologists, available for Consultation on Matters Affecting the British Fauna,' by Mrs. M. D. Brindley ; and ' Design and Equipment of Zoological Laboratories,' by Prof. D. M. S. Watson. The meeting was probably of outstanding importance from the practical demonstrations which were made by experts on the methods of illustrating zoological literature. By the aid of a camera lucida and by free-hand drawings and various methods of shading, the wonderful representations of zoological objects recently appearing in the Proceedings of the Royal and other Societies, were demonstrated, the details being admirably illustrated by enlarged photographs. Among those present were Professor Garstang, Mr. T. Sheppard, and Mr. C. F. Procter.

# YORKSHIRE MYCOLOGISTS AT BARNARD CASTLE.

F. A. MASON AND JOHN GRAINGER.

The Annual Meeting of the Mycological Committee of the Yorkshire Naturalists' Union was held at Barnard Castle from September 16th to September 23rd, 1933, with the Station Hotel as headquarters. There was a good attendance of members of the Committee, and also a few members of the Union. A prolonged spell of dry weather preceded the period of the excursion, so the larger fungi were somewhat rare. This focussed the attention of members upon such fungi as were available, particularly the Ascomycetes and Rust Fungi. It was particularly appropriate that Mr. T. Petch, B.A., B.Sc., delivered a lecture on ' The Classification of the Pyrenomycetes ' on Sunday, September 17th. This gave a valuable lead to the younger members, and was admirably adapted to stimulate interest in the particular branch. The speaker dealt with the books available for the student, and when the lack of an up-to-date work was patent, readily undertook to compile a descriptive list of species of several common genera. It is hoped that this will form a basis for much more intensive study of the Ascomycetes than has been possible in the past.

On Saturday, September 16th, Mr. A. A. Pearson gave a talk on ' New Light on Cooke's Illustrations.' Owing to revisions in the classification of Basidiomycetes, the names upon many of the illustrations prepared by Cooke have now become obsolete and Mr. Pearson has prepared an annotated list to enable the ' Illustrations ' to be used with accuracy by the modern student.

The Chairman's address by Mr. A. E. Peck took the form of a public lecture on ' Edible and Poisonous Mushrooms ' in the Congregational Schoolroom, on Monday evening, September 18th. The lecture was well illustrated with lantern slides from Mr. Peck's extensive collection, and brought back memories of previous Fungus Forays.

On Tuesday evening Mr. T. Petch gave a very interesting address on ' Some Reminiscences of a Government Mycologist,' in which he sketched the rise and development of Mycology in Ceylon.

Excursions were arranged to Pecknell and Lartington Woods (when the Committee was joined by members of the Darlington and Teesdale Naturalists' Field Club), Rokeby Park, Baldersdale, Brignall Banks, Barningham Park, and Thorsgill. Mr. J. B. Nicholson, M.A., Secretary of the Darlington and Teesdale Club, and Mr. M. S. Welsh, of Barnard Castle, made very efficient local guides, and earned the gratitude of all present.

The Annual Meeting of the Committee was held at headquarters on Saturday evening, September 16th, at 8 p.m. The Chairman (Mr. A. E. Peck) presided. Mr. Petch was unanimously elected Chairman for the coming year. There were no changes in the officers of the Committee, but Mr. J. L. Illingworth, M.A., of Burley-in-Wharfedale, and Miss E. Hughes, of Leeds, were elected members.

The season was characterised by an unusual paucity of fleshy fungi. Many genera of the Agaricineæ are entirely absent from the list of species collected, and it is the only Autumn Foray during which no specimen of any species of Amanita was recorded. Campestral species, including many of the common coprophiles, were practically absent, and of any one of the species recorded the numbers found were very few indeed. For once in a while the attention usually claimed by the larger fungi was diverted to the more intensive collection of species belonging to other groups with highly satisfactory results. The Mycological Committee may be congratulated on the additions made to our knowledge of fungi in N.W. Yorkshire, and the gatherings include fifty-three species new to V.C. 65, among which six of them are new to the County records. Since the Foray, contributions to the list have been received from Messrs. W. G. Bramley, J. W. H. Johnson, A. E. Peck, T. Petch, and W. P. Winter.

The following abbreviations are used to denote the districts in which the records were made :—

L.=Lartington ; D.=Deepdale ; B.=Baldersdale ; C.=Cronkley (Yorks. side) ; R.=Rokeby. Where species are recorded from Barnard Castle=BC., it indicates collection on the Durham side of the Tees. *=new to N.W. (V.C.) ; †=new to Yorkshire.

The nomenclature used in the list of Basidiomycetes is that of C. Rea's ' British Basidiomycetæ,' and for the Uredines, W. B. Grove's ' The British Rust Fungi.'

*Armillaria mellea*, L., D.
*Tricholoma rutilans*, L., D.
*T. melaleucum*,
*Hygrophorus psittacinus* } High
**H. fornicatus* } Force.
*H. chlorophanus* }
*Russula xerampelina*, R.
*R. alutacea*, D.
*Mycena galericulata*, L., B.
*M. galericulata* var. *calopus*, D.
*M. metata*, L.
*M. galopus*, L.
*Marasmius hariolorum*, D.
*M. dryophilus*, High Force.
**Androsaceus graminum*, D.
*Lactarius pyrogalus*, D.
*L. subdulcis*, L.
*Clitocybe infundibuliformis*, L., D., High Force.
*C. fragrans*, L.
*Collybia radicata*, L.
*Omphalia fibula*, D.
**Pleurotus corticatus*, R.
**P. sapidus*, L., B.
**P. geogenius*, D.
*Lentinus cochleatus*, D.
*Pluteus cervinus*, L., D.
*Entoloma sericeum*, High Force.
*Leptonia incana*, L.
*Clitopilus prunulus*, R.
†*C. orcelloides*, R.
*Tubaria furfuracea*, D., High Force.
*Pholiota flammans*, L.
*P. mutabilis*, D., B.
*Inocybe rimosa*, D.
*I. geophylla*, D.
**I. cincinnata*, L.
**Astrosporina scabella*, L.
**Hebeloma radicatum*, L.
*Naucoria escharoides*, L., R., D.
*Stropharia æruginosa*, L., D.
*S. semiglobata*, D., High Force.
*Crepidotus mollis*, L.
*Hypholoma fasciculare*, L., R., D., B.
*H. mesophæum*, L.
**H. radicosum*, L.
*H. velutinum*, L.
*Coprinus micaceus*, D.
*Coprinus plicatilis*, B.
*C. atramentarius*, D.
*C. cinereus*, D.
*Paxillus involutus*, D., L., R.
*Boletus elegans*, L.
*B. subtomentosus*, D.
*B. scaber*, D.
*Polyporus nummularius*, D.
*P. squamosus*, L., R.
*P. sulphureus*, L.
*P. giganteus*, L., R.
*P. betulinus*, B.
*P. hispidus*, D., L.
*P. adustus*, R.
*P. fragilis*, L.
*P. radiatus*, BC.
*Fomes ferruginosus*, R.
*F. annosus*, L., D.
*Ganoderma applanatum*, D.
**Poria hymenocystis*, L.
*Polystictus versicolor*, L., D., R., B.
*P. abietinus*.
*Irpex obliquus*, L., D., R., B.
**Trametes gibbosa*, L.
*Dædalea quercina*, L.
**Merulius serpens*, L.
*M. lacrymans*, L.
**Coniophora arida*, L.
*Fistulina hepatica*, L., D.
*Hydnum repandum*, L.
*Mycoleptodon fimbriatum*, L.
*Stereum hirsutum*, R., B.
*Hypochnus fuscus*, L.
*Hymenochæte rubiginosa*, L. D., B.
*H. Mougeotii*, D.
**Corticium arachnoideum*, B.
**C. subcoronatum*, L.
*C. botryosum*, R.
*Peniophora hydnoides*, L., R.
*Clavaria cinerea*, D.
**Pistillaria pusilla*, D.
†*Sebacina sphærosperma*, Bourd. and Galz., R.
†*Heterochætella crystallina* Bourd., D.
*Dacryomyces deliquescens*, L., D.
*Calocera viscosa*, D.
*C. cornea*, D.
**C. stricta*, B.

*Uromyces Alchemillæ* on *A. vulgaris*, R., D., C.
*U. Geranii* on *G. sylvaticum*, R., D.
*U. Valerianæ* on *V. dioica*, D., HF.
**U. Acetosæ* on *Rumex acetosa*, B.
*Puccina Poarum* on *T. farfara*, L., R., B., D.
*P. Poarum* on Poa sp., B., D.
**P. Cirsii* on *C. heterophyllum*, L., B.
*P. obscura* on *Luzula sylvatica*, L., R., B., D., HF.
**P. Valantiæ* on *Galium cruciatum*, L., B.
*P. Malvacearum* on hollyhock, BC.
*P. Veronicarum* on *V. chamædrys* and *V. montana*, L., R., D.
**P. Chrysosplenii* on *C. oppositifolium*, L., R., D.
*P. Lychnidearum* on *L. diurna*, R., L.
*P. Saniculæ* on *S. europæa*, R., D.
*P. obtegens on Cirsium arvense*, R.
*P. Chondrillæ* on *Lactuca muralis*, B.
*P. Taraxaci* on *T. officinale*, B.
*P. Leontodontis* on *L. autumnalis*, B.
*P. Centaureæ* on *C. niger*, B., D.
*P. oblongata* on *Luzula campestris*, B.
**P. Zopfii* on *Caltha*, D.
*P. Menthæ* on *M. aquatica*, D.
*P. Violæ* on *V. canina*, D., HF.
*P. coronata* on *Holcus mollis*, B.
*P. Caricis* on *Carex acuta*, B.
**P. perplexans* on *Arrhenathera elatius*, B.
**P. Magnusiana* on *Phragmites*, D.
*P. dispersa* on *Bromus sylvaticum*, D.
*Triphragmium Ulmariæ* on *S. ulmaria*, D.
*Phragmidium Fragariastri* on *P. fragariastrum*, BC.
*P. Rubi* on *Rubus*, L.
*Xenodochus carbonarius* on *S. officinalis*, D., C.
*Gymnosporangium clavariæforme* on hawthorn, HF.
**G. Juniperi* on *P. aucuparia*, HF.
*Coleosporium Tussilaginis* on *T. farfara*, L., R., B., D.
**C. Petasitis* on *P. officinalis*, L., R., B., D.
**C. Euphrasiæ* on *E. officinalis*, C.
**C. Campanulæ* on *C. rotundifolia*, C.
*Melampsora Larici-Caprearum* on *S. caprea*, L.
**M. Allii-populina* on *P. alba*, L.
*M. Allii-fragilis* on *Salix fragilis*, B.
*Melampsoridium betulinum* on *B. alba*, D.
*Pucciniastrum Circeæ* on *C. lutetiana*, R., D.

*Ustilago violacea* on *Lychnis diurna*, B., R.
*U. Violæ* on *V. Riviniana*, L.

---

*Gymnoascus Reesii* Baran., on dead wasp, B.
*Podosphæra leucotricha* (Ell. and Ev.), Salmon on Hawthorn, D., BC.
*Sphæotheca pannosa* (Wallr.) Lév., on *Rosa arvensis*, L., BC.
*S. Humuli* (D., C.) Burr., on *Galeopsis*, B., D.
*Microsphæra Grossulariæ* (Wallr.) Lév., on gooseberry, R.
*Erysiphe graminis*, D., C., on *Triticum repens*, B.
*E. Cichoracearum*, D., C., on *Galium cruciatum*, B., D.
**Phyllactinia Corylea* (Pers.) Karst., on hazel, D.
**Aleuria repanda* (Pers.) Gill., B.
*Galactinia badia* (Pers.) Boud., D.
*Ciliaria scutellata* (Linn.) Quel., B.
*Ombrophila clavus* (A. & S.) Cke., D.
*Coryne sarcoides* (Jacq.) Tul., L.
*Helotium herbarum* (Pers.) Fr., D., R., L.

*Chlorosplenium æruginosum* (Oeder) de Not., L., B., R.
*Trichoscypha calycina* (Schum.) Boud., D., R.
*Hyaloscypha hyalina* (Pers.) Boud., L.
*Mollisia cinerea* (Batsch) Fr., D., R., B.
*Rhytisma acerinum* (Pers.) Fr., common.
*Nectria cinnabarina* (Tode) Fr., common.
*N. coccinea* (Pers.) Fr., D.
*Rhopographis pteridis* (Sow.) Wint., on bracken, L.
†*Rosellinia thelena* (Fr.) Rabenh., D.
*Melanomma pulvis-pyrius* (Pers.) Fuckel, L.
*Stigmatea Robertiana* Fr., L., D.
*Hypoxylon multiforme* Fr., D.
*H. fuscum* (Pers.) Fr., L.
*Xylaria polymorpha* (Pers.) Grev., L., R.
*X. Hypoxylon* (Linn.) Fr., R., D.

---

**Stilbospora macrosperma* Pers., L.
*Acremonium album* Preuss, on *Cribraria rufa*, D.
*Aegerita candida* Pers., D.
*Dactylium dendroides* (Bull.) Fr., on a polyporus, B.
*Bactridium flavum* K. and S., R.
*Cladosporium herbarum* (Pers.) Link, on flies and aphids, L., R., D.
**Cephalosporium muscarium* Petch, on flies and aphids, L., R., D. ; on beetle, D.
*Isaria farinosa* (Holms.) Fr., on pupæ, B., D., BC.
**Hymenostilbe arachnophila* (Ditm.) Petch, on spiders, L., D.
**Gibellula araneum* (Schw.) Syd., on spider, D.
**Hirsutella acridiorum* Petch, on a cricket, L.
*Stilbum tomentosum* Schrad. (small-spored form), on *Trichia persimilis*, B.
*S. erythrocephalum* Ditm., on rabbit dung, L.

---

*Empusa muscæ* Cohn., on an aphid, D. ; on a fly, BC.
**E. Planchoniana* (Cornu) Thaxter, on aphids, D.
**Entomophthora sphærosperma* Fres., on aphis, L., D. ; on flies, L., D., BC. ; on ichneumons, D.
**E. echinospora* Thaxter, on flies, L.
**E. variabilis* Thaxter, on flies, L.
†*E. aphrophoræ* Rostrup, on froghoppers, L., D.
†*E. Coleopterorum* Petch, on beetle larvæ, L.
**E. dipterigena* Thaxter, on flies, D., L.
**E. muscivora* Schroet, on fly, R.
**E. americana* Thaxter, on flies, B., D.
*E. Aphidis* Hoffm., on aphids, B., D.
†*E. Richteri* (Bres. and Star.) Bubak (=*E. lauxaniæ* Bubak), on flies, R., B., D.
*Chaetocladium jonesii* Fres., on *Mucor mucedo* Linn., on insert eggs, D.

---

*Badhamia panicea* Rost., D.
**Physarum viride* Pers., B.
*P. nutans* Pers., D., L., B., R.
*Fuligo septica* Gmelin., L., B., D.
*Stemonitis fusca*, Roth., R.
*Comatricha nigra* Schroet., B.
**Cribraria rufa* Rost., D.
**Dictydium cancellatum* Macbr., D.
*Tubifera ferruginosa* Gmel., B., D.
*Lycogala epidendrum* Fr., D.,B.
*Trichia persimilis* Karst., B., L.
*T. varia* Pers., B.
*T. Botrytis* Pers., L., B., R., D.
*S. splendens*, R., L. Rost.
*Arcyria denudata* Sheldon, D., B., L.
*A. incarnata* Pers., D.

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In the Review of "Virus Diseases and Plants" the author's name was given as S. Grainger. This should read "J. Grainger," the book having been written by the Curator of the Tolson Memorial Museum, Huddersfield.

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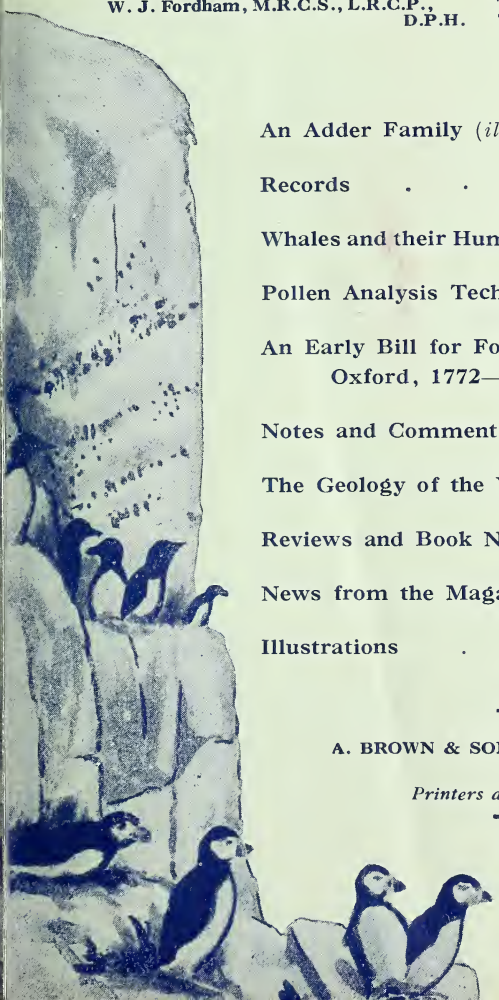

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## AN ADDER FAMILY.

ELLEN GALLWEY.

The sun was shining brightly as Dr. Morrison and I climbed the steep slope of Ben Gullion, the highest peak near Campbeltown, Argyllshire, on Friday, August 18th, 1933. The ground was carpeted with purple heather, the sky was clear and birds were chirping merrily.

A beautiful specimen of the Adder or Viper (*Vipera berus*) was also there, basking peacefully in the sunshine, and returned to Huddersfield the next day with me where we became very friendly, the reptile being christened 'Liza.' She shared a cage with another very large bad-tempered adder.

Liza measured 20 inches, and was always a sweet-natured animal, so that one took real pleasure in looking after her. Although she drank much water, she would not bathe, and every day she enjoyed basking on the lawn in the sunshine whilst I gently stroked her.

Sunday, September 3rd, was a bright sunny day with an atmospheric temperature of 85 deg. F., the temperature in Liza's cage in a glass-house facing south being 100 deg. As usual, my first duty was to visit Liza, who seemed quite normal, but when revisited at 10-15 a.m. she had a new arrival calmly gliding about surveying the cage. At first glance I thought by some strange way an inmate of the next cage must have gained access, for it was a great surprise.

I opened the cage door, and lo ! another dark little head with beady eyes popped up through a sod. Liza was lying stretched out on top of the sods. Then a third was born, a fourth, fifth and sixth—by 11-30 a.m. The mother was very weak and nervous, so I stood quietly watching, notebook in hand.

Each of Liza's charming babies was born in a membraneous sac, from which it straightway escaped. The empty sac melted in the sun, resembling deep yellow fat, then caked and cracked, much like sun-dried raw hen egg.

Then each baby cast a perfectly white slough in true snake fashion, rubbing back the 'skin' from the mouth, and walking out of it, leaving the slough lying among the grass stalks, inverted. The young serpent was warm, very lively, and quite firm to the touch.

After casting, the babies exhibited individual taste, some going for a swim and others to inspect their surroundings. All six were in perfect physical condition, and strongly resented handling. Then in order to work under reasonable conditions I removed the vicious adder, hissing loudly, to another cage, leaving the mother and family there alone.

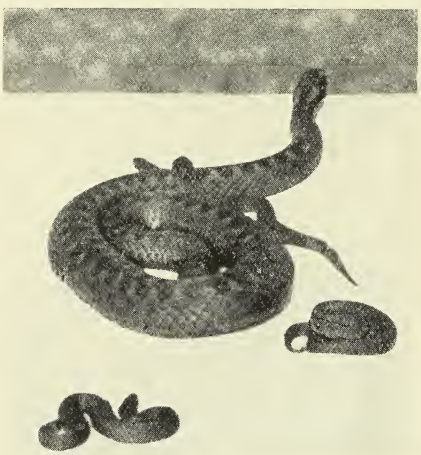


MAY 16 1934

Three times during the fortnight before the birth I extracted venom from Liza for experimental purposes.

The length of the babies varied between six and six-and-a-half inches at birth, and the heaviest weighed 3·2 grammes ; the average weight was 3·0 grammes. Scalation and markings were perfect, but one difference between the young and their mother was that the young had fawn-brown ventral shields, whereas those of a mature viper are dark grey or black. All fangs were perfect and active, though no venom was available.

The mother lay about resting on the sods of Hair-grass (*Deschampsia flexuosa*) which formed the bedding of her cage, sunning herself, but when I touched her she glided rapidly



[*Photo by kind permission of The Yorkshire Post*]
**Liza and Three Young. September 4th, 1933.**

under the sods. Although the young seemed to seek her company fairly often, Liza never seemed to show any interest in them.

It is often said that a mother adder will swallow her young in their time of danger, but, unfortunately, no material evidence can be found in support. It is possible, for the gullet of the adder can be greatly distended, and the period when the phenomena is said to take place must necessarily be very short, as the young are born only in late August or September, and go into hibernation early in October. A reward of £10 is on offer to anyone who can produce the body of a mother adder containing her brood in the æsophagus ; this reward has more than once been claimed, but in each case it was found that the brood was contained in the body of the adder (which brings forth its young alive), and not in the

æsophagus. In *The Faerie Queene,* Book I, the Dragon of Error swallows up her brood at the approach of the Red Crosse Knight, but this cannot be accepted as any kind of evidence. However, Dr. Rudolph Menger, the American herpetologist, has proved that one of the Rattlesnakes does swallow her young, so that perhaps another (our own adder) may too, but we have no proof.

Being interested in this question, I endeavoured to prove it one way or the other, with my own family of adders. Six hours after birth I shook the cage violently, in which was the brood, whereupon the mother and babies dashed under the sods at the nearest possible spot to which they were—each one for itself. This is what we might expect in so low a class of animal, for the motherly instinct indicates a higher form of development altogether.

Two or three times at intervals I repeated this experiment, but the result was always the same ; the mother's whole thought was for her own safety, and the babies did not look to her for any help.

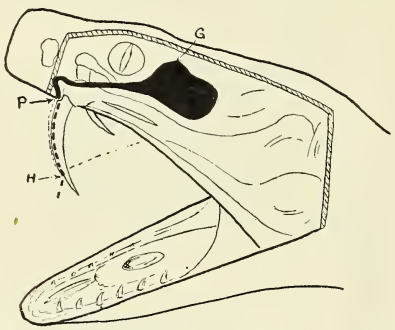
However, sometimes on going to my pets, instead of darting under the sods, the young darted under the mother, very quickly. They simply disappeared from view and could not be noticed. It was all the work of just a second or two, and I must admit at first I myself looked, and wondered if I had seen aright. Had the young after all gone into the mouth of the mother? It looked very like it, but I was not satisfied to leave it at that. I removed the cage bedding very carefully, piece by piece, but there was no sign of the brood until at last there was only the mother, coiled, in the cage. I looked at her, but could see nothing more. Then I lifted her out, and there were all six youngsters coiled up under the coils of the mother—absolutely invisible until then. On September 25th, when collecting the young for weighing purposes, two were ' missing ' and those two were under Liza. Can it be possible that when I have been told in all sincerity that the narrator had witnessed a mother adder swallowing her young he had really seen the young dart beneath the mother and thus lost sight of them for the time? I do know that very few people would try lifting up an adder at large. One can readily understand that once the young are safely beneath their mother who is lying on grass, clumps of heather, etc., they can easily and very quickly disappear under the undergrowth, so that when the mother does move away, she leaves no sign of young. However, there is no proof of swallowing at present, although it may possibly take place. The act will be admitted and recognised when the required proof—the body containing the young brought in for dissection and preservation—is produced.

*1934 May 1*

About 6 p.m. on the day of birth the babies seemed to learn how to bite, and they quickly developed a very marked biting tendency, as though quite pleased with themselves. They tried their fangs on everything with which they came into contact, even their earthenware water container and myself.

A glass bowl containing cream and raw hen egg well beaten together was kept in their cage and the quantity decreased more than seemed accountable by evaporation, though I never saw a young adder touch it. The babies, however, like their mother, did drink large quantities of water. Under the sods I had a quantity of leaf-mould in the hope that perhaps the babies would take tiny insects which would be lurking in it.

On September 4th I heard a baby hiss for the first time, and on Tuesday, the 5th, the first discharge of venom was




**Dissected Head of British Adder** ×2½.
to show the venom apparatus.

given. On mixing this venom with blood, the characteristic reaction of blood with viperine venom took place. The red corpuscles in the blood lost their biconcave shape, became spherical and softened, and fused together into irregular masses. The late Professor Calmette, of Paris, worked out a table of the relative toxicity of venoms based on the number of grammes of a rabbit killed by one gramme of venom subcutaneously introduced. He found the toxic value of our viper or adder to be 250,000. Adder venom yields 30 per cent. of its weight in solids and has a specific gravity of 1·030 to 1·080. Dr. Morrison informs me that adder venom kept by him unsealed, and in light, retained its toxicity for over three months.

Perhaps a word or two on the venom apparatus of our adder would not be out of place. The venom is secreted by the cells of a compound racemose gland (G), the modified salivary gland of other vertebrates. Each gland lies behind

the orbit, beneath the masseter muscles with which it is intimately connected. A duct leads from the gland under the eye, and just in front of the fang the duct doubles on itself so as to open by a small papilla (P) on the anterior wall of the mucous membrane sheath surrounding the tooth base. At the base of the fang is a hole into which the venom is conducted. The fang itself is hollow, and there is another hole (H) just above the end of the fang on its anterior curve. Here the venom leaves the fang and enters the wound to do its deadly work. Fortunately our adder is an inoffensive reptile and if left alone it always tries to get out of the way. It should never be wantonly killed, for it is a great aid to farmers

**Longitudinal Section of Fang.**
(Photomicrograph).

**Tranverse Section of Fang.**
Showing the canal through which the venom is conducted.

in destroying vermin. In *The Life Story of the Adder*, Dr. N. Morrison describes dissecting a full-grown rat from the stomach of a twenty-one inch viper.

The baby adders were very irritable and inclined to be treacherous, and although they had not so much venom as their parent, what they had was just as dangerous.

Their respective weights on the 11th September were :—

1. 3·19 gms.
2. 3·29 ,,
3. 3·10 gms.
4. 3·22 ,,
5. 2·63 gms.

a gain in each case.

I could not discover the 6th at the time, and in each set of weights, the numbers refer to the same adder.

No. 4 struck out readily with determined zest and hatred. Byt this time, when the cage lock was clicked, the babies had got used to it and no longer did they seek shelter, but

drew themselves up in a defensive attitude where they were.

By September 25th they were showing a strong inclination to rest and sleep. Although in fine condition, there was a slight decrease in weight :—

| | | |
|---|---|---|
| 1. | 3·08 gms. | Loss in two weeks ·30 gm. |
| 2. | 3·24 ,, | ,, ,, ,, ,, ·35 ,, |
| 3. | 3·09 ,, | ,, ,, ,, ,, ·29 ,, |
| 4. | 3·18 ,, | ,, ,, ,, ,, ·26 ,, |

**Skull of Adder.** ×2
Showing spare sets of Fangs.

On October 20th all except baby No. 4, were very friendly, and the following day I transferred my family from the snake house into my study for company. The babies tended to hibernate.

On November 23rd Liza caught a chill as a result of a sudden drop in temperature in the night, which resulted in her death on the 30th of the month, after fifteen weeks in captivity. Adders in captivity usually die within twelve weeks.[1]

[*Photo by Dr. Grainger*]
**Head of Mother Adder.** ×2.
Showing Fangs.

Periodically, adders shed their fangs, when duplicate pairs move forward in about one or two weeks to take their place.

At the time of Liza's death the left fang was normal ; on the right two fangs were in position, one immediately behind the other, both showing on erection. This seems very unusual.

[1] *The Naturalist*, May, 1933, p. 97, "The Viper in Captivity."

On December 2nd the weighing results were :—

| | | |
|---|---|---|
| 1. | 2·46 gms. | Loss in ten weeks ·62 gm. |
| 2. | 2·75 ,, | ,, ,, ,, ,, ·49 ,, |
| 3. | 2·56 ,, | ,, ,, ,, ,, ·53 ,, |
| 4. | 2·65 ,, | ,, ,, ,, ,, ·53 ,, |

and on this day the brood was transferred to a temperature varying around 65 deg. F., which accounted for their greater activity.

They were weighed again on December 23rd, when they were once more gaining weight, though slowly :—

| | | |
|---|---|---|
| 1. | 2·514 gms. | Gain in three weeks ·054 gm. |
| 2. | 2·820 ,, | ,, ,, ,, ,, ·07 ,, |
| 3. | 2·700 ,, | ,, ,, ,, ,, ·04 ,, |
| 4. | 2·800 ,, | ,, ,, ,, ,, ·05 ,, |

On December 30th the young seemed to have lost all inclination towards sleep, and weighed :—

| | | |
|---|---|---|
| 1. | 2·61 gms. | Gain in one week ·096 gm. |
| 2. | 2·71 ,, | Loss ,, ,, ,, ·110 ,, |
| 3. | 2·631 ,, | ,, ,, ,, ,, ·069 ,, |
| 4. | 2·800 ,, | ,, ,, ,, ,, ·160 ,, |

Steady loss in weight occurred until January 23rd, 1934, when their respective weights were :—

| | | |
|---|---|---|
| 1. | 1·50 gms. | Loss in three weeks 1·11 gms. |
| 2. | 2·65 ,, | ,, ,, ,, ,, ·06 ,, |
| 3. | 1·55 ,, | ,, ,, ,, ,, 1·08 ,, |
| 4. | 2·63 ,, | ,, ,, ,, ,, ·01 ,, |

Baby No. 1 showed signs of illness, and died five days later on January 27th (after twenty-one weeks in captivity), having grown three-quarters of an inch since birth ; her length at death was seven inches.

On February 3rd, after being exhibited at a Naturalist Society's Conversazione in Huddersfield, one was given to Mr. G. Iles, Zoological Manager of the Belle Vue Zoological Gardens, Manchester, where it is still doing very well (February 16th), although after being in captivity for twenty-four weeks.

They are still alive (February 16th) and weighed on this date :—

2. 2·43 gms. Length 7 inches, gain of 1 inch since birth.
4. 2·30 ,, ,, $6\frac{1}{4}$ ,, ,, $\frac{3}{8}$ ,, ,, ,,

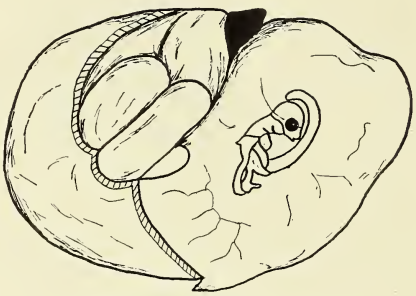
The ventral shields have gradually darkened, and are now the typical greyish-black.

The gestation period in the adder, Dr. Morrison informed me, is four and a half months, or 135 days, and adders give birth to up to a dozen young in the end of August or September. Dr. Morrison had a premature birth on August 15th, 1917, and in *The Naturalist* of January, 1929, p. 35 (' Birth of

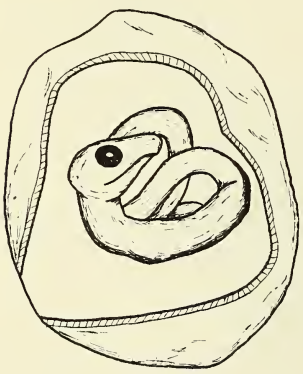
Adders in Captivity ') he records a birth of eight on October 1st, 1928.

The accompanying sketches showing the development of the adder embryo are of specimens now exhibited in the Tolson Memorial Museum, Huddersfield.

**Fourteen Days OVUM.** ×2.

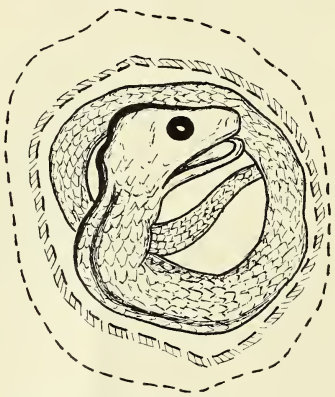


**One Month EMBRYO.** ×2.



**Ten Weeks EMBRYO.** ×2.

No scalation is visible, and the mouth is now developing.



**Three Months EMBRYO.** ×2.

The dotted line represents the removed membrane. Very minute scales are visible on the body ; these are pale pinkish-fawn, much darker near the dorsal line, though the characteristic zig-zag marking is still absent.

In the *Sunday Chronicle* for February 25th, a note appeared under the heading of ' Snake Amazes Experts,' reading :—

> ' The mystery of the viper on the window is puzzling experts on snakes. Hitherto, it has been understood that snakes can climb up anything except glass. Mr. Gerald Iles, the Curator of animals at Belle Vue, Manchester, has a five months old viper, or adder, in a glass-fronted cage in his office. He was absolutely amazed the other morning

to see it clinging to the glass unsupported. Mr. Iles has written to the Zoo officials in London for their opinion.'

This ' mysterious ' viper is the one out of this brood of six. When born, they were in a cage with a glass door, with a frame about two inches wide, and when just a day or two old, they used to scramble on to this wood ledge, and press themselves against the glass door, then drop backwards. When they were transferred to my study, the cage they inhabited had four glass sides, held in position by four narrow wooden posts, one at each corner. In here the babies pressed themselves against the wood part, and went up as far as they could—at first just an inch or two. After this, a few weeks later, they could go about four inches up the corner posts, then they would turn part of their bodies at right-angles to the rest, and endeavour to creep along the glass, but always without success. They lost their balance and fell backwards. But these young adders had nothing else to do all day long, except explore their cage, so that in time they became quite expert not only at climbing up the posts, but up the glass panes, until when about twelve to fourteen weeks old, they could take their whole length vertically up the glass panes, only touching the bedding or cage bottom with the tip of their tails. Hence their unusual behaviour ; practice makes perfect !

## RECORDS.

### ANOTHER OCCURRENCE OF BOREUS HYEMALIS LATR. IN YORKSHIRE.

This rare little insect has turned up again in Yorkshire, a specimen having occurred to Mr. L. E. Gallagher, of Bradford, who writes, ' I found a female specimen of *Boreus hyemalis* on the 21st January of this year. I took the insect in the wood at the top of Holling's Hill between Otley and Shipley ; it was on open ground at the foot of a tree and appeared to be alone.'

The species is known from four localities in Yorkshire. It was first taken quite commonly on Eston Moor by Prof. J. W. H. Harrison (*Vasculum*, 1915, p. 57). In November, 1920, it was taken almost simultaneously by Mr. C. A. Cheetham, in moss on a limestone wall at the foot of Smearsett in the West Riding, and by Mr. G. B. Walsh, in moss at Hay Brow, near Scalby, in the North Riding, and recorded in *The Naturalist* for 1921.

It has occurred since in the East Riding to Mr. T. Stainforth and the writer in moss on Allerthorpe Common in November of various years. These latter occurrences have not yet been

recorded. *Boreus* is local but widely distributed in Britain and occurs more commonly in the north than in the south. In Scotland it has been recorded from the Edinburgh district, Midlothian, East Lothian, Lanark, Fife and Stirling. The larva has occurred in June, 1932, at Killin, Perthshire, to Mr. K. G. Blair. In the northern counties it is recorded from Wooler, in Northumberland, by Mr. J. Hardy, and from Birtley, Co. Durham, by Prof. Harrison. There are no records known to the writer from the Midlands and Eastern Counties, but it has occurred in the South of England in Middlesex (Southgate and Stanmore Common), at Croydon, Feldon in Herts., Epping Forest, Hayes in Kent, and in Buckinghamshire.

It occurs on moss-covered walls, in mossy banks, and moss at the foot of trees in open woods from October to March, being most common usually about November. It can live on the surface of snow and feeds on the bases of moss leaves. It has been noted on *Mnium hornum*, on which ite specially feeds, *Hypnum splendens*, *Dicranum scoparium*, *Polytrichum* spp., and probably occurs on many other species. The larva lives in earth or moss and pupates in the early autumn.—WM. J. FORDHAM, M.R.C.S., L.R.C.P., D.P.H.

### A NEW YORKSHIRE PLANT GALL.

SOROSPHAERA VERONICAE Schroeter, Engler and Prantl., *Die Nat. Pflanzenf.*, 1 Teil, 1 Abth., p. 6 ; Blomfield and Schwartz, 'Some Observations on the Tumours on *Veronica Chamædrys*,' Ann. Bot. XXIV, 1910, pp. 35-43, Pl.. V.

A specimen of *V. chamædrys* bearing tumours on the leaves was collected at Jervaulx Abbey, August, 1933, by Miss Kathleen Morehouse. A full account of the causative organism has been given by Blomfield and Schwartz, who have described its effects upon the host-plant. Various parts of the plant are liable to be attacked and stems, petioles, and leaves may all show signs of invasion, although the commonest form is that of distortion by swollen stems ; the tubercles vary in size and may be as small as a pin's head or as large as that of the last joint of the little finger. Slugs are very fond of the tubercles and possibly play a part in the dissemination of the disease. The tumours which escape the attention of slugs become soft and rotten and their final disintegration permits the liberation of zoospheres. The spores probably germinate in the soil where the young amoeboid cells live until they meet with a fresh host-plant.

The organism is closely allied to *Plasmodiophora brassicæ*, which causes 'Club Root' in cruciferous plants.—F. A. MASON.

# WHALES AND THEIR HUMAN ENEMIES.

ROBERT W. GRAY.

Whales, as is well known, are mammals modified to lead an oceanic life. Nature in their case has worked wonders, but unfortunately she has left them singularly vulnerable as regards attack from above. A whale, as regards its human enemies, is very much in the position of a submarine in war time ; it is safe while submerged but liable to be seen and attacked when at the surface. The whale is even worse off than the submarine because it is without a periscope and has no means of surveying the surrounding waters.

The facts can be looked at in another way ; a whale lying motionless at the surface is at the mercy of a bird, or of a man standing on a rock or a piece of ice near which it has been unfortunate enough to rise. In the same way it is at the mercy of a man in the bow of a boat, and if the latter has approached the whale instead of the other way about, the result is the same—the animal is in a dangerous position.

If there is any truth in what I have just said, whales are well advised to keep away from ships and boats. But do they? Much depends on the species concerned and the amount of persecution it has been subjected to ; also on what the animals are doing at the time and the mood they are in.

Some whales, particularly the toothed kind, are at times playful and interested in a ship or boat. Take, for instance, the Bottle nose, *Hyperoödon rostrata*, a relative of the Sperm Whale, an inhabitant of the North Atlantic, and a cetacean reaching a length of about 30 feet and a girth of about 20 feet.

When the sound of a ship's propeller reached a herd of Bottle-noses, the animals, as I can well remember, instead of becoming alarmed and making off in the opposite direction, at once started towards the place whence the sound came, bent apparently on ascertaining the cause of the unusual disturbance. Great was their haste and excitement on these occasions ; their ' blasts ' or breath rose higher into the air than usual. The water broke white in front of their advancing heads, and, at times, their tails were brought down on the surface with loud smacks. Arrived at the ship, which being a whaler had in the meantime stopped, the excited whales circled round and round it, and under it, until their curiosity was satisfied. After this, if not already fired at, they sometimes lay resting and breathing at the surface, quite near, as if the ship was a big and friendly brother. The resting and breathing whales formed an interesting and remarkable sight ; besides their breathing made a peculiar sound.

When whales, particularly whalebone whales, are feeding they often seem to be too intent on their purpose to pay much

heed to a passing or approaching ship or boat. A log-book in my possession contains the following entry :—' Augt. 4th, 1880 ; Lat. 68° N. Long. 4° W. ; fell in with an extraordinary number of Hunchback Whales ; some hundreds of them were feeding and blowing all round the ship, and even under the very bowsprit.'

Sir James Clark Ross, who visited the Antarctic Seas about one hundred years ago, saw great numbers of whalebone whales feeding among or in the vicinity of the ice. In his account of his voyage he says : ' a great many whales were seen, and were so tame that our ships (the *Erebus* and *Terror*) sailing past them did not seem to disturb them.' (Vol. I, p. 169.)

Again, he says : ' We observed a very great number of the largest sized black whales, so tame that they allowed the ships almost to touch them before they would get out of the way ' (Vol. II, p. 327).

At the present time, as is well known, a great many whalebone whales are being killed in Antarctic waters. In 1931-1932, the total number killed, according to Dr. Stanley Kemp, exceeded 35,000.[1] Without a doubt, the great majority of these whales were killed when engaged in filling their capacious stomachs with crustaceans, and when they were too intent on their purpose to notice the whaling steamers bent on their destruction.

What about the Greenland whale, an Arctic cetacean, once very numerous, but now, alas, very scarce, if not extinct ?

Each time the Greenland whale comes up to the surface it usually remains visible one or two minutes, and breathes a number of times. After describing the Greenland whale's behaviour when feeding, in a paragraph too long to quote, my father says : ' more whales have been caught when feeding in this way than in any other ; they lie longer on the surface, and generally head the same way each time they appear. This (last fact) is very important to the whale-fishers because whales must be approached tail on to give any certainty of getting near enough to have a chance of harpooning them and (after watching one) the harpooner has a better idea where to place his boat to be in readiness to pull on to them (*i.e.* near enough and heading in the right direction) whenever they come to the surface.'[2]

I now propose to refer to several questions that arise in connection with the capture of whales.

Firstly, why do whales allow themselves to be approached by a ship or boat when they might very easily escape ? Are

[1] *Polar Record*, No. 3, Jan., 1933, p. 27.

[2] ' Structure and Habits of (Greenland) Whales,' Buckland's *Notes and Jottings*, p. 332.

they stupid? Are they blind? Are they deaf? Or are they, like the lions we read about, so full of confidence that they are not usually apprehensive as regards their safety?

For the following reasons, I think the answer must be, at any rate, to some extent, in accordance with the last alternative.

(*a*) They can hardly be very stupid; (as I am about to show) they seem to learn by experience, and when attacked they vary their behaviour according to circumstances. The Greenland whale, for instance, usually 'sounded' or went vertically down when attacked, but if there was ice of a particular kind about, it almost invariably fled to it for safety, and usually escaped, sometimes with a mile or two of valuable whale-line. In 1895 a Greenland whale struck in circumstances of this sort by the *Polar Star*, of Dundee, escaped with about 3000 fathoms of whale-line. It was afterwards found floating dead by another ship.[1]

(*b*) They can hardly be blind; Greenland whales and Narwhales are able to avoid the pieces of ice among which they live. The Greenland whale, as my father says, had to be approached from behind, and as may be inferred from what Scoresby says (*l.c.* Vol. I, p. 176, and Vol. II, p. 220) it is are difficult to approach in bright sunshine and when the water is very clear.[2]

Among the ice each time the whale comes up to breathe, it usually remains about two minutes at the surface, giving a boat situated for approaching it from behind and not too far away, a good chance of reaching it before it descends.

(*c*) They can hardly be deaf; as already stated, Bottlenose Whales can hear a ship's engines miles away. The same statement may be made with confidence concerning the Greenland whale. Lastly, as Scoresby says (*l.c.* Vol. II, p. 338) Greenland whales are difficult or impossible to approach in calm weather.[3]

The conclusion arrived at implies that the whalebone whales have no natural enemies worth considering, and that they are not naturally apprehensive. But what about the Killer or Orca? It is a powerful-looking animal and is armed with formidable teeth, is known to attack seals and porpoises and to help itself to parts of dead whales, and is even said to attack them when alive.

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[1] See my 'Peterhead Sealers and Whalers,' *Scottish Naturalist*, Nov.-Dec., pp. 164 and 165.

[2] The 1817 log-book of Scoresby Sen., contains the following significant entry:—'June 18th, saw several fish, but for the brightness of the sun a clearness of the water, the boats never got near any of them.'

[3] A log-book in my possession contains the following significant entries:—'June, 1876, Lat. 79°, 7°, Lat. 79°, "saw a whale but being calm did not send the boats away." June 9th, scared a whale with the engines to-day.'

The evidence on this last point seems inconclusive. On the one hand, R. C. Andrews, in his book, *Whale-hunting with Gun and Camera* (p. 199), says they do[1]; on the other, the *Discovery* Report on Blue and Fin Whales makes no mention of wounds or scars due to conflicts with Killer Whales ; in his *First Crossing of Greenland* (p. 90), Nansen states that the Killer Whales seen off the coast of Norway showed no inclination to attack the ' Finners,' and that the two species were often seen feeding side by side ; lastly, in the Greenland Sea, Killer Whales are not seen amongst the ice—they cannot therefore, be a very important enemy of the Greenland Whale in that quarter.[2]

Are whales capable of learning? And do they, in course of time, become timid and more and more concerned as to their safety? The evidence seems inconclusive. Take, for instance, the Greenland Whales.

Down to quite recent times Greenland Whales seem to have been as easily approached as ever. Only a few years before the fishing was finally given up cases occurred of Greenland Whales rising alongside a ship and of their having been harpooned off the deck. An instance occurred in 1905 (see *Notes on the Arctic Whaling Voyage of* 1905, by T. Southwell, Zoologist, 1906, p. 31) and a log-book in my possession dated 1895 contains the following entry, June 2nd, ' A whale rose at the ship's (port) side ; the starboard waist boat was lowered down, the fish went under the ship and came up at the boat's bow, when G—— M—— (fired and) got fast ; length of bone 5′ 10″.'

On the other hand, in the eighteen-eighties, the Greenland Whale, as I have often observed, had to be looked for among the recesses of the ice, and, generally, in the waters west of Spitzbergen, as soon as the state of the ice permitted they buried themselves in the depths of the Arctic Ocean and were not seen again until the following spring. Hear what my father has to say in this connection. ' Whales,' he says, ' will never lie on " banks " where there is not sufficient shelter (*i.e.* ice) for them. In fact, nowadays, more especially since the introduction of " steam," whales are like rats or rabbits, never to be found very far away from their holes ' (' Notes on the Greenland Whale-bone Whale,' *Scottish Fishery Board's Seventh Annual Report*, Part 3, p. 366).

There is one other piece of evidence : when Greenland

[1] R. C. Andrew's sensational statements are based on hearsay, not on personal observation.

[2] The Killer Whale is not mentioned in the log-books of Scoresby Senr., nor in the whaling parts of the many log-books in my possession. Neither is it referred to in the *Arctic Regions*, a work which deals with the Greenland Sea. In the course of eight voyages to the Greenland Sea I never once saw a Killer Whale among the ice.

Whales were attacked they made a great mistake in ' sounding ' and would often have done better if they had made off in a horizontal direction. After referring to this fact, my father says, ' Should a whale escape, and be again harpooned, it never commits the same mistake again, no matter how many years may have elapsed ; it always sets off along the surface and is very difficult to catch, often tearing out the harpoon or breaking the line. Scoresby says that a whale's brain is only a three-thousandth of its weight, but it has a very good memory nevertheless ' (' Structure and Habits of Greenland Whales,' *loc. cit.*, p. 324).

I have had some experience of the capture of the Greenland Whale, and if I was asked to explain how that great mammal was so easily caught I should be inclined to answer as follows :

(1) Like other whales, it is easily seen. It advertises itself by its ' blast ' or breath, which is visible from a ship's mast-head miles away, and by its habit of going ' tail-up ' or raising its large tail in the air when about to descend. Even when it is under water its position when feeding is frequently indicated by an ' eddy ' or wake, which breaks out the surface due to the powerful action of its tail, and as Scoresby says (*loc. cit.*, Vol. 2, p. 240) Fulmars sometimes indicated its position and movements to its pursuers by following it and hovering over it even when under water.

(2) When at the surface, provided the water is not too clear and not too brightly illuminated and its surface not too smooth, it could usually be approached within harpooning distance by a boat using muffled oars without being seen or heard. The reasons for this appear to be as follows :

(*a*) It was usually feeding and too intent on its purpose to notice an approaching boat.

(*b*) Owing to the shortness of its neck it is unable to turn its head and look round.

(*c*) When at the surface its vision as Scoresby says (*loc. cit.*, Vol. 1, p. 465) is imperfect. Why? Firstly, because owing to the position of its eyes it is blind as regards objects in front of it and behind it ; secondly, because its eyes are very near the surface and its field of vision in an upward direction is for this reason limited.

(*d*) When under water and favourably situated for seeing objects at the surface, it may mistake a ship or a boat for a piece of ice.

(*e*) Its hearing, on which it must largely depend, is also imperfect when at the surface. Why? Firstly,

because its head is usually partly out of the water ; secondly, because there was usually a breeze and the noise made by an approaching boat was drowned by the noise made by the waves lapping against the pieces of ice.

(3) When it was harpooned it usually sounded or went vertically down to the depth of about a mile, and when it reappeared it was in an exhausted condition and easily harpooned a second time.

(4) Its body floated if it was completely exhausted and rendered incapable of leaving the surface before it was killed.

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## POLLEN ANALYSIS TECHNIQUE.

W. H. BURRELL, F.L.S.

Readers of *The Naturalist* who follow peat studies will be interested to know that an improved technique has been developed by G. and H. Erdtman, of which a preliminary account is given in *Svensk Botanisk Tidskrift*, 1933 Bd. 27, H.3. Objections to the methods hitherto in use, which the authors are seeking to overcome are the variable results liable to attend the alkali treatment of raw peat, the difficulty of finding pollen in sufficient quantity in some peats for a reliable estimate of percentage numbers, and error in estimating relative frequencies, by loss of smaller pollens when the cover glass is pressed down on slide.

Using a definite weight of dried powdered peat, the new process contemplates the destruction of the lignin and humic acid by oxidation in a twelve hour treatment in the cold with Sodium chlorate and acid. The residue after washing, which consists largely of cell walls, is hydrolised with 80 per cent. sulphuric acid to get rid of cellulose and hermicellulose. The more resistent pollens, spores and cuticles are collected and washed by centrifuging, dispersed in lactophenol, stained with methylene blue and the pollens counted, using a counting chamber of 0.1 cc. capacity specially designed by the authors to carry the largest pollens and at the same time allow the use of high power objectives.

' Pollen frequency,' *i.e.* the number of tree pollens counted in 1 sq. cm. of a prepared microscope slide, has been an inexact number, influenced by variable thickness of the preparation. For it is now substituted an ' Absolute Pollen frequency ' which is defined as the amount of pollen in one gram of dry peat.

# AN EARLY BILL FOR FOSSILS FROM JOSHUA PLATT, OF OXFORD, 1772.

C. DAVIES SHERBORN.

THE Geological Department of the British Museum has lately acquired a five-page manuscript entitled 'Extraneous Fossils selected in January, 1772, for Christopher Sykes, Esqre, of Wheldrick, near York, by Joshua Platt at Oxford, *Aetatis suæ* 73.' By permission of the Keeper, Dr. W. D. Lang, I am able to print this together with such notes as I have been able to find. The manuscript came with an odd collection of fossils and minerals which formerly belonged to Lady Sarah Creswick (née Walker) with much of which it does not appear to have any connection. Notes of prices paid for specimens occur in the Sloaneian and other early Catalogues (*teste* L. J. Spencer), but this is the earliest bill for specimens that has come to my notice.

Joshua Platt was the donor of 'Massa concharum lapidea a Pago Brill allata' to the Old Ashmolean Museum in 1757-9, but the specimen is lost (Gunther, Early Sci. Oxford, III, 1925, 578) and was the Author of the following papers in the *Phil. Trans. Roy. Soc.*, 'An Account of the fossile Thigh-bone of a large Animal, dug up at Stonesfield, near Woodstock, in Oxfordshire' (L. 1759, 524) and 'An attempt to account for the Origin and the formation of the extraneous fossil commonly called the Belemnite' (LV, 1765, 38) the manuscript of which latter (or a fair copy of it) is now in the possession of L. Bairstow, Esq., of the British Museum.

Of Christopher Sykes (1749—1801[1]), Mr. Thomas Sheppard has obligingly furnished me with the following extract from Fairfax-Blakeborough, Sykes of Sledmere (1929, p. 35): 'Christopher Sykes, of Wheldrake, near York, was born in 1749 and received the M.A. Degree in 1770 [Brasenose College], and was married on October 20th of that year. His children were born at Wheldrake and Mrs. Christopher Sykes (who had resumed her maiden name in 1780 and died in that year) had inherited her brother's estate, and on the death of her aunt, Elizabeth Egerton, she further inherited a fortune of £60,000, which enabled Sir Christopher to set about the great agricultural and arboricultural evolution which stands as a monument to his name.'

Joshua Platt appears to have been a dealer or curiosity-monger (1699—1773+) of the period and it is interesting to note the range of his stock. Such specimens as he supplied that preserve his original numbers can be identified. It is, however, tantalizing not to know what his number 166 was, priced so highly in comparison with the others, but the

[1] Obituary in *Gent. Mag.* 1801, pp. 870 and 1049.

manuscript has suffered greatly from damp, has a large hole in the centre, and is much decayed at the bottom.

The twenty-one specimens now identified as belonging to this 1772 collection are not of scientific but archæological value.

Extraneous Fossils
selected in January, 1772,
for
Christopher Sykes, Esqre.,
of Wheldrick, near
York,
By Joshua Platt at
Oxford.
*Aetatis suæ*, 73.

| | | | |
|---|---|---|---|
| 1 | Asteriæ, from Stratford upon Avon | 0 | 6 |
| 2 | Nine Anomiæ Striatæ, from Stonesfield & Bladen, various | 1 | 6 |
| 3 | Three small Ammonitæ Wornaldwood, Bucks. | 1 | 0 |
| 4 | Four Anomiæ planæ, seu terebratulæ, Kidlington, Oxon | 0 | 6 |
| 5 | Do seu Saculi, Blackthorn near Bicester Oxon | 0 | 6 |
| 6 | Anomiæ planæ from the banks of Year near Norwich | 0 | 6 |
| 7 | Do from Purfleet Essex, bedded in Chalk | 0 | 6 |
| 8 | Anomia Striata, sing Valve in Stonsfield slate | 0 | 6 |
| 9 | Impress of an Ammonite—*Ibid* | 0 | 6 |
| 10 | Vertebræ of an Ammonite, exhibits the Sutures Marsham | 0 | 6 |
| 11 | Ammonites ground down, and polished. Garsington | 1 | 0 |
| 12 | The Babel Buccinum, a curious fossil from Hordel cliff, Hans | 2 | 6 |
| 13 | Buccinum with shorter clavicle *Ibid*— | 1 | 0 |
| 14 | Do murica(ted &) Spiked *Ibid*— | 1 | 0 |
| 15 | Do from (the r)iver bank, near Norwich | 1 | 0 |
| 16 | Buccini(tes from) Thame | 0 | 6 |
| 17 | Do from ( )ton | 0 | 6 |
| 18 | Bufonites ( )landen and Stonsfield | 1 | 0 |
| 19 | Bucardites from Thame | 0 | 6 |
| 20 | Twelve small spiral Buccina, Hordel cliff, curious | 1 | 6 |
| 21 | Belemnites from Garsington | 1 | 0 |
| *22 | Do split to exhibit the Alveolus *Ibid* | 1 | 0 |
| 23 | Do with tubuli vermiculares *Ibid* | 1 | 0 |
| 24 | Do Fusiform, from Thame and Stonsfield | 1 | 0 |
| 25 | Do Nondescript from river Yare bank chalk pit | 1 | 0 |
| 26 | Do from Shotover clay | 1 | 0 |
| *27 | Back of the Spider Crab, from Sheppey Island | 0 | 6 |
| 28 | Five small specimens out of Chalk Purfleet | 0 | 6 |
| 29 | Four pair bivalves Hordel Cliff | 1 | 0 |
| 30 | Crushed Anomiæ Striaræ, Banbury | 0 | 6 |
| 31 | Cuneites from Radipole near Melcombe | 0 | 6 |
| 32 | Cochlites from Sheppey Island | 0 | 6 |
| 33 | Chama from Bath ; the valves displaced | 1 | 0 |
| 34 | Corallo-Fungus, seu Fungites, Six Specms Dudley Staffordsh " | 1 | 0 |
| 35 | Rhamous Coral detatched | 0 | 6 |
| 36 | Astroites bored with Pholades Headington Heath | 0 | 6 |
| 37 | Madrepora Coralloides with quadrilateral Septa radiated to a central cell or cup from Dudley Staffordshire | 1 | 0 |
| 38 | Porous Coral *Ibid* | 0 | 6 |
| | | 1 11 | 6 |

* Those marked with an asterisk have been identified.

2.

| | | | | |
|---|---|---|---|---|
| *39 | Punctured Madrepore *Ibid* | 0 | 6 |
| 40 | Madrepore with small tubercles *Ibid* | 0 | 6 |
| 41 | Entrochi, a curious mass, with some detatched Staffordsh'' | 1 | 0 |
| 42 | Echinus Cordatus Purfleet Essex | 1 | 0 |
| 43 | Do Galeatus *Ibid* | 1 | 0 |
| 44 | Do Pileatus *Ibid* | 1 | 0 |
| 45 | Do Ouarius—two from Bladen— | 1 | 0 |
| 46 | Do Clypiatus, seu Discoides, *Ibid* | 0 | 6 |
| 47 | Do Spatagus cordiformis—Garsington | 1 | 0 |
| 48 | Do Pentaphiloides—*Ibid* | 1 | 0 |
| 49 | Do Clunoides, Stonsfield | 0 | 6 |
| 50 | Do Rotundus *Ibid* | 0 | 6 |
| 51 | Flint, impression Chama Thame | 0 | 6 |
| 52 | Flint i(mpression) Anomia Striata *Ibid* | 0 | 6 |
| 53 | Part of ( ) exhibits four Vertebræ, Sheppey | 1 | 0 |
| 54 | Geode ( ) St. Clements—wrong placed | 0 | 6 |
| 55 | A fine ( ) Pyrton passage Glocestershire | 0 | 6 |
| 56 | Do wi( )ge Hinksey near Oxford | 1 | 0 |
| 57 | Lower va( )phite Pyrton passage | 0 | 6 |
| 58 | Group of Auricular Oisters—Marsham | 1 | 0 |
| 59 | Geodes out of Chalk—Purfleet a native fossil misplaced | 0 | 6 |
| 60 | Hippocephaloides, Brill in Bucks | 0 | 6 |
| 61 | Do from Thame | 0 | 6 |
| 62 | Lithophites from Coalbrook Dale A. | 1 | 0 |
| 63 | Do—*Ibid* B. | 1 | 0 |
| 64 | Do—*Ibid* C. | 1 | 0 |
| 65 | Do—*Ibid* D. | 1 | 0 |
| 66 | Do—*Ibid* E. | 1 | 0 |
| 67 | Do—*Ibid* F. | 1 | 0 |
| 68 | Do —G—near Wigan Lancashire—Haigh | 1 | 0 |
| 69 | Do—H—*Ibid* | 1 | 0 |
| 70 | Do I *Ibid* | 1 | 0 |
| 71 | Do—K. *Ibid* | 1 | 0 |
| 72 | Do—L. *Ibid* | 1 | 0 |
| 73 | Do—M. *Ibid* | 1 | 0 |
| 74 | Do—N. *Ibid* Quincurx | 1 | 0 |
| 75 | Murex from Hordel Cliff | 1 | 0 |
| 76 | Ammonites from Stonsfield slate | 0 | 6 |
| 77 | Two Masses from Hordel | 1 | 0 |
| | | 1 | 12 | 0 |

3

| | | | | |
|---|---|---|---|---|
| 78 | Smyrna Muscle in Stonsfield Slate, curious | 1 | 0 |
| *79 | Do small one detatched *Ibid*—inclose with No. 144 | 0 | 6 |
| 80 | Musculites, *Ibid*—a cast of the like to No. 78 | 0 | 6 |
| 81 | Two Do from Thame—I never saw them elsewhere | 0 | 6 |
| 82 | Musculites, seu Solenites from Garsington | 0 | 6 |
| 83 | Mass of rhamous White Coral, Wiltshire | 1 | 0 |
| *84 | Do—of Shells—*Ibid* | 1 | 0 |
| 85 | Nummularii lapides—from Turin | 0 | 6 |
| *86 | Nautilites, with three valves of the same Wilts | 0 | 6 |
| 87 | Oister from Iffley | 1 | 0 |
| 88 | Do both valves loose *Ibid* | 1 | 0 |
| *89 | Lower Valve ( )corated with worm tubes. Horton Bucks | 0 | 6 |

* Those marked with an asterisk have been identified.

| | | | | |
|---|---|---|---|---|
| 90 | Flat Ois( ) Clay | 0 | 6 |
| 91 | Two O(isters ) del | 1 | 0 |
| 92 | Smal( ) field | 0 | 6 |
| 93 | Two ( ) *Ibid* | 0 | 6 |
| 94 | Sickle ( ) field | 0 | 6 |
| *95 | Flat ( )m Bath | 0 | 6 |
| *96 | Two upp( ) of Auricula Oisters Shotover | 0 | 6 |
| 97 | Oister with ( )ecorated with auriculares Thame | 1 | 0 |
| 98 | Do with wor(m t)ubes *Ibid* | 1 | 0 |
| 99 | Do with Pholades— | 0 | 6 |
| 100 | Single Valve of a Pectin very fine | 1 | 0 |
| 101 | Pectunculites in flint—Thame gravelpit | 1 | 0 |
| 102 | Porpites or buttonstone St. Clements | 0 | 6 |
| *103 | Pectunculus from Bath—very pretty | 1 | 0 |
| 104 | Three small Pectens—Garsington | 0 | 6 |
| 105 | Pholades, out of Coral Headington Heath | 0 | 6 |
| *106 | Pectunculus from Thame— | 1 | 0 |
| 107 | Single Valve of Do—*Ibid* | 1 | 0 |
| 108 | Plectronites Lhuidii—seu Fungites Dudley | 0 | 6 |
| 109 | Pectunculus—Headington Heath | 0 | 6 |
| 110 | Do from Stonsfield | 0 | 6 |
| 111 | Strombus, or Spire Garsington | 0 | 6 |
| 112 | Strombites with the cast of ( ) | 0 | 6 |
| 113 | Do all Spar Shotover | 0 | 6 |
| *114 | Siliquistrum A tortite gibbose ( ) Stonsfield | 0 | 6 |
| 115 | Spines of the Echinus mamillarius from Basset, Wilts | 2 | 0 |
| | | 1 | 7 | 0 |

4.

| | | | | |
|---|---|---|---|---|
| 116 | Two small Slabs for (*sic*) Dudley Staffordshire | 1 | 0 |
| *117 | Squilla from Sheppey Island | 2 | 6 |
| 118 | Seeds frm *Ibid* | 0 | 6 |
| *119 | Scallops from Garsington | 0 | 6 |
| 120 | Syringoides lapis, Sheppey | 1 | 0 |
| 121 | Trochus from Dudley, Staffordshire | 0 | 6 |
| *122 | Do with transverse Striæ—*Ibid* | 0 | 6 |
| 123 | Do Clavicle more elate Headington Heath | 0 | 6 |
| 124 | Trochites—Thame | 0 | 6 |
| 125 | Do from G( ) | 0 | 6 |
| 126 | Do from ( ) | 0 | 6 |
| 127 | Six teeth ( ) Shark Sheppey | 2 | 0 |
| 128 | Seve( )idii *Ibid* | 2 | 0 |
| 129 | Tusi ( ) see Bufonites | 0 | 6 |
| 130 | Tel( )yton, Shropshire | 1 | 0 |
| 131 | Tric( ) tley | 0 | 6 |
| 132 | Thig( )tonsfield | 4 | 0 |
| *133 | Part ( )de *Ibid* | 1 | 0 |
| 134 | Vertebr(a ) Quarry Clay | 1 | 0 |
| 135 | Do very ( )ord | 1 | 0 |
| 136 | Six Do from Sheppey | 1 | 0 |
| 137 | Vermili four near Oxford | 0 | 6 |
| 138 | Four Do coiled up *Ibid* | 0 | 6 |
| 139 | Four Do in groupes Thame | 0 | 6 |
| 140 | Four Do attached to other bodies Shotov | 1 | 0 |
| 141 | Wood reduced to Charcoal by the Vague Acid, Shotover Clay | 0 | 6 |
| 142 | Wood, bone and Stone in Stonsfield Slate | 0 | 6 |

* Those marked with an asterisk have been identified.

| | | | | |
|---|---|---|---|---|
| 143 | Do saturated with Crystal, very curious from Coventry | 2 | 6 |
| 144 | Six small Anomiæ Oxfordshire | 0 | 6 |
| *145 | Two Anomiæ Striatæ curious—Shotover | 0 | 6 |
| *146 | Anomia Striata Burst *Ibid* | 0 | 6 |
| *147 | Two good Specns of Do *Ibid* | 0 | 6 |
| 148 | Chama from Headington (Heath) | 9 | 6 |
| 149 | Arctia Noe Garsington | 0 | 6 |
| 150 | Crab four Sheppey | 1 | 0 |
| 151 | Double edge Cuneites | 0 | 6 |
| | | 1 | 13 | 0 |

5.

| | | | | |
|---|---|---|---|---|
| *152 | Two large Bufonites from Stonsfield | 1 | 0 |
| 153 | Skeleton Crab & Spider Crab Sheppey | 0 | 6 |
| 154 | Echinites Cordatus—near Henley | 1 | 0 |
| 155 | Echinites Cordatus charged with Flint Purfleet | 1 | 0 |
| 156 | Echinites Galeatus Shiplake | 0 | 6 |
| 157 | Echinites Ovarius, Headington Rubblepits | 0 | 6 |
| 158 | Echinites Clypiatus—Burford | 0 | 6 |
| 159 | Echinites Pileatus Henley | 0 | 6 |
| 160 | Free Ois( )ton | 0 | 6 |
| 161 | Group ( )ters Shotover | 1 | 0 |
| 162 | Oiste( ) and Pholades | 0 | 6 |
| *163 | La( ) Spines from Mount Carmel | 1 | 0 |
| 164 | ( ) | 0 | 6 |
| *165 | ( ) Stonsfield | 0 | 6 |
| 166 | ( ) dley | 6 | 0 |
| 167 | ( ) | 1 | 0 |
| 168 | ( )alk | 0 | 6 |
| 169 | Fo( ) Shotover | 0 | 6 |
| 170 | Six ( )ol | 0 | 6 |
| 171 | Trochu( ), Bucks | 0 | 6 |
| 172 | Do Small—Sheppey Island | | |
| | | 0 | 18 | 6 |
| | | 1 | 13 | 0 |
| | | 1 | 7 | 0 |
| | | 1 | 12 | 0 |
| | | 1 | 11 | 6 |
| | | £7 | 2 | 0 |

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We find in No. 60 of the *Bulletin of the South-Eastern Union of Scientific Societies* that ' An extensive scheme for the Recording of Immigrant Insects in Great Britain has been promulgated by a Sub-Committee of the Zoological Section, under the guidance of Mr. Robert Adkin and Secretaryship of Captain T. Danreuther, R.N., Windycroft, Hastings, Sussex, and help is invited. For the present particular attention is being devoted to the commoner and more conspicuous non-resident migrants and especially to the Painted Lady Butterfly (*Pyrameis cardui*), the Red Admiral (*Pyrameis atalanta*), the Clouded Yellows (*Colias croceus* and *C. hyale*), the Silver Y Moth (*Plusia gamma*), and the small Diamond-back Moth (*Plutella maculipennis*). Observations of other immigrants species, such as many of the Hawk Moths, will be welcomed.'

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* Those marked with an asterisk have been identified.

## NOTES AND COMMENTS.

### WILD BOAR IN HOLDERNESS GLACIAL BEDS.

Among a collection of bones from the Glacial Gravels at Kelsey Hill I find we have one which is water-worn, measuring $3\frac{3}{4}$ inches long and this has been identified by Mr. Martin A. C. Hinton, of the British Museum (Natural History) as the fourth metatarsal (left side) of a Wild Boar, *Sus scrofa*. This is an addition to the list of species from the Glacial beds of Yorkshire. (See ' Classified List of Organic Remains from the Rocks of the East Riding of Yorkshire,' by H. C. Drake and T. Sheppard, *Proceedings Yorkshire Geological Society*, Volume XVII, Part I, 1909.)—T. Sheppard, The Museum, Hull.

### HABITATS OF LAND MOLLUSCA.

Our contributor, Professor A. E. Boycott, states, ' Our land mollusca do not form specific associations with one another or with other animals or plants. Competition is therefore an unimportant factor. Their occurrences within their geographical ranges are determined by the conditions of the environment, the most important factors being moisture and lime. We may distinguish groups which affect wet places, dry places and human settlements. The rest, about half the species, live in ill-defined " woodland " habitats whose suitability varies in proportion to the shelter and lime they provide. In the alternative classification, we have one calcifuge species, about twenty calcicoles, about eighteen which prefer lime and some forty-five which are indifferent.' This is the conclusion he arrives at after a lengthy discussion on The Habitats of Land Mollusca in Britain in *The Journal of Ecology* for February. The report is illustrated by 25 maps showing distribution of mollusca in Britain in relation to lime.

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## THE GEOLOGY OF THE YORKSHIRE DALES.

A very useful summary of West Yorkshire geology was written for the summer meeting of the Geologists' Association last year and has since appeared in the *Proceedings* (XLIV, 227-269, 1933). It contains a series of papers in convenient form summarising much recent work. The main article by Dr. R. G. S. Hudson deals with the scenery and geology of North-West Yorkshire. It is accompanied by shorter accounts of the phyllogeny of the North of England goniatites by W. S. Bisat, on Alum Pot by H. W. Haywood, and on the glacial and post-glacial periods in West Yorkshire by Dr. A. Raistrick. The latter indicates the archæological correlations. This pamphlet is probably known to most geologists and it can be recommended also to those who take a general interest in the subject. A second paper, written by Dr. R. G. S. Hudson and Prof. W. B. R. King, reports the results of the excursions at the summer meeting (*Proc. Geol. Assoc.*, XLIV, 428-440, 1933). Both are well illustrated.

## REVIEWS AND BOOK NOTICES.

**The Generic Names of British Insects** (Royal Entomological Society of London), Part I, pp. 7, price 6d. ; and Part II, pp. 39, price 3s. 6d. Last year the Council of the Royal Entomological Society appointed a committee to prepare lists of specific names of British insects. This committee subsequently appointed sub-committees to deal with the various orders or groups of orders. One of these sub-committees has now completed its report, which is embodied in Part II of the present publication. It gives the generic names of the British Rhopalocera and a check list of the species as prepared (largely by Mr. Francis Hemming). There is also the list of recommendations to be made to the International Commission on Zoological Nomenclature. We may warmly commend the idea of these reports. They themselves will be required by every entomologist, and it is to be hoped that similar action may be taken in respect of other major groups of organisms by the responsible taxonomists.

**Insects as Material for Study,** Two Inaugural Lectures delivered by **G. D. Hale Carpenter, D.M., Hope Professor of Zoology (Entomology),** Oxford, 2/6, published by the Clarendon Press, 1934, 38 pp., 5 inches by 9 inches, one plate. This pamphlet is very pleasant reading. Although the specialist may say, ' We know all that,' he cannot but feel a genuine pleasure in reading again how insects and their study have contributed to the elucidation of major biological problems. The study of insects in relation to disease, to parasitism, and to evolution is presented in a most inspiring form. One aspect of the subject seems to be missing. Surely genetics might have found a paragraph. However, two lectures are obviously insufficient to indicate everything, and we leave the pamphlet wishing it were twice its length.—H.H.

**Memoirs of a Camp Follower,** by **Philip Gosse,** pp. xvi+300, Messrs. Longmans, Green and Co., price 10/6. Dr. Gosse was a Territorial M.O. in the R.A.M.C. and for practically the duration of the Great War was stationed in Flanders. Doubtless, he could have written an enthralling book dealing with exciting military events, but as a naturalist he found many matters to interest him which had little to do with war. In this delightful book of reminiscences we can read once again how the true naturalist can be happy anywhere, even in the trenches. Dr. Gosse had plenty of professional work to do, but during slack times observed and collected for the British Museum the small mammals of Belgium. He watched many birds and his accounts of his observations make fascinating reading. Towards the close of 1917 he was drafted to India where again he found birds and mammals more interesting than people, especially some people ! It is fortunate that his many long letters written from the front to his parents were preserved and available for him to supplement the contents of his diary, a notebook which ' was in no sense a war diary or journal, for it was all about birds and beasts, and no military event or happening appears in it unless it has especial bearing on some bird or animal.' The reviewer can think of many naturalists who were soldiers for a time who will derive keen pleasure from this book. There are many amusing anecdotes, not all of which are concerned with natural history !

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## NEWS FROM THE MAGAZINES.

*The Entomologists' Record* for January contains ' Entomological Notes of the Season 1933 in the North of Ireland,' by T. Greer ; ' Collecting Butterflies in Orissa (Bikar and Orissa), India,' by W. M. Crawford ; several scientific notes and observations and notes on collecting ; and Supplement, ' British Noctuæ,' by H. J. Turner.

*The Entomologist* for February contains ' Some Observations on *Acherontia atropos*, with special reference to the loss in weight which occurs during the pupal state,' by L. G. Hulls ; ' Notes on Two Collections of Butterflies made in Palestine, with a Note on the Occurrence in Transjordan of an Unrecorded Species,' by F. Hemming ; ' Indo-Australian Hesperidæ : Descriptions of new Genera, Species and Sub-species,' by W. H. Evans ; ' Notes on Nine Genera of Butterflies,' by F. Hemming ; and numerous notes and observations.

*The Entomologist* for March contains ' A List of the British butterflies as revised by the Royal Enomological Society of London,' by F. Hemming (an important list bringing the nomenclature up to date), ' Butterflies of 1933 as recorded at Chichester,' by S. Morris ; ' Notes on Four Species of British Lithocolletis,' by G. H. Heath, ' A new Micro-lepidopteron (*Lepidoptera Tineria*) from Greenland,' by E. Meyrick ; ' *Amblypodia democritus* Fab. (=*albopunctata* Hew.) (*L. Lycaenidae,*' by A. S. Corbet ; ' Indo-Australian Hesperiidae : descriptions of new genera, species, and sub-species,' by W. H. Evans, and numerous notes and observations.

*The Entomologists' Monthly Magazine* for January contains ' Notes on Some Odonata, Trichoptera and Neuroptera Collected in Corsica,' by K. J. Morton ; ' A Species of Tachys (*Coleoptera, Carabidæ*), from the New Forest, new to Science,' by T. H. Edmonds (*Tachys piceus*) ; ' *Tychus ibericus* Motsch. (Col. Pselaphidæ), a Beetle new to Britian,' by H. Donisthorpe (Windsor Forest, at roots of Willow stump) ; ' Additions to the List of British Dolerinæ (*Hymenoptera Symphyta*) ' and ' Five Nematinæ new to the British List (*Hymenoptera Symphyta*) ' by R. B. Benson ; ' *Hydrotæa nidicola* Malloch. (*Anthomyidæ*), a new British Dipturon,' by E. B. Basden (Berkshire) ; ' Description of a new Asilid (Diptera) from Madagascar,' by B. M. Hobby ; ' Two Notes on the Behaviour of *Volvucella pellucens* in its Association with the Wasps *Vespa vulgaris* Linn. and *Vespa germanica* Fab.', by G. E. J. Nixon ; ' More Notes on Cornish Diptera,' by A. Thornley ; and several short notes.

The Council of the Geological Society of London announce the following awards for 1934 :—

The Wollaston Medal to Sir Henry Alexander Miers, Honorary Professor of Crystallography in the University of Manchester, for his researches ' concerning the Mineral Structure of the Earth ' and especially in the realms of Crystallography and Mineralogy.

The Murchison Medal to Professor George Hickling, of Armstrong College, Newcastle-upon-Tyne.

A Lyell Medal to the Rev. Walter Howchin, Emeritus Professor of Geology and Palæontology in the University of Adelaide, South Australia, for his geological and palæontological researches in Australia, and particularly for his investigations of ancient glacial deposits.

A Lyell Medal to Dr. Finley Lorimer Kitchin (since deceased) of H.M. Geological Survey, in recognition of the value of his contributions to Palæontological Science.

The Balance of the Proceeds of the Wollaston Fund to Dr. William Richard Jones, of the Royal School of Mines, in recognition of the value of his work in Economic Geology and his recent investigations on silicosis.

The Balance of the Proceeds of the Murchison Fund to Dr. John Wilfrid Jackson, Assistant Keeper in the Manchester Museum, for his contributions to Pleistocene Geology and Palæontology and to Malacology ; also to Carboniferous stratigraphy.

The Balance of the Proceeds of the Lyell Fund to Mr. Frederick William Shotton, in recognition of the value of his work on the Upper Palæozoic and Quaternary rocks of the Midlands.

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JUN 14 1934
NATIONAL MUSEUM

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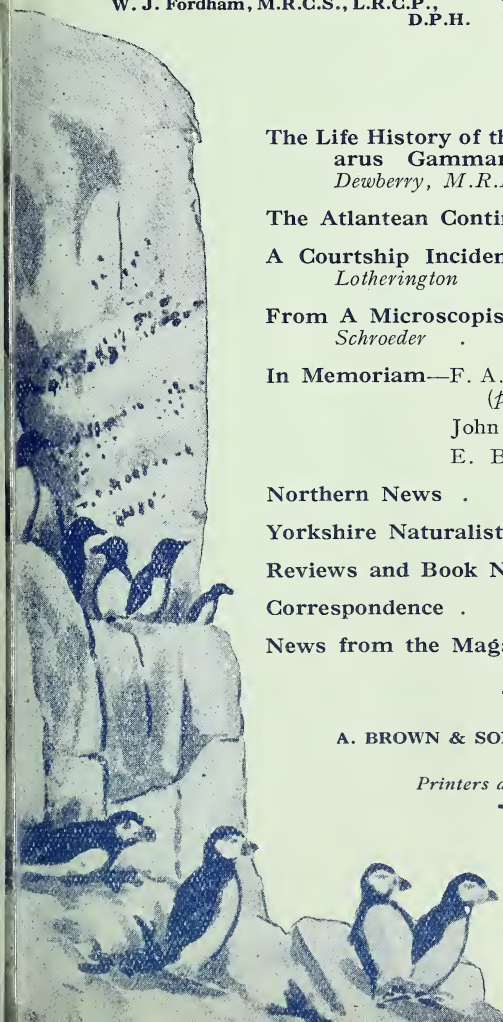

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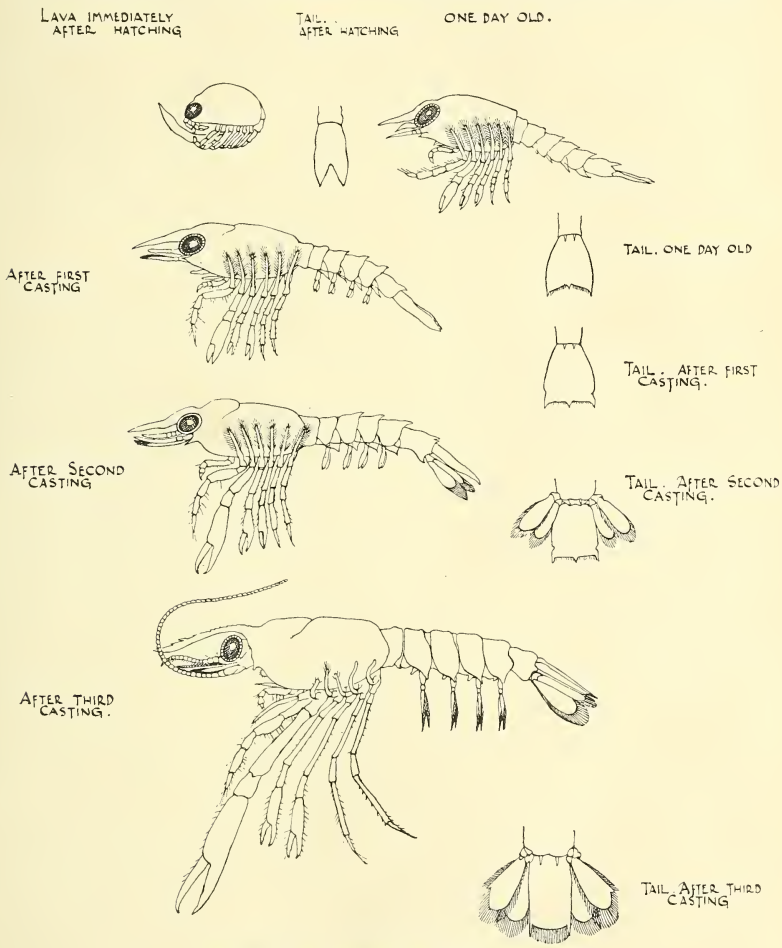
# THE LIFE HISTORY OF THE COMMON LOBSTER (*HOMARUS GAMMARUS*).

ELLIOT B. DEWBERRY, M.R.I.P.H., M.R.SAN.I.

THE lobster, which is regarded as the ' king of crustaceans,' was described in the ancient writings of Aristotle and Pliny,




**Stages in the Development of the Lobster.**
(magnified 5 times) (*after H. C. Chadwick*).

and sometimes referred to as the ' locust of the sea.' There are several species of lobster, but the European and American are the most valuable of all the edible varieties. The American species is found on the Atlantic coast from Labrador to Cape



JUN 13 1934

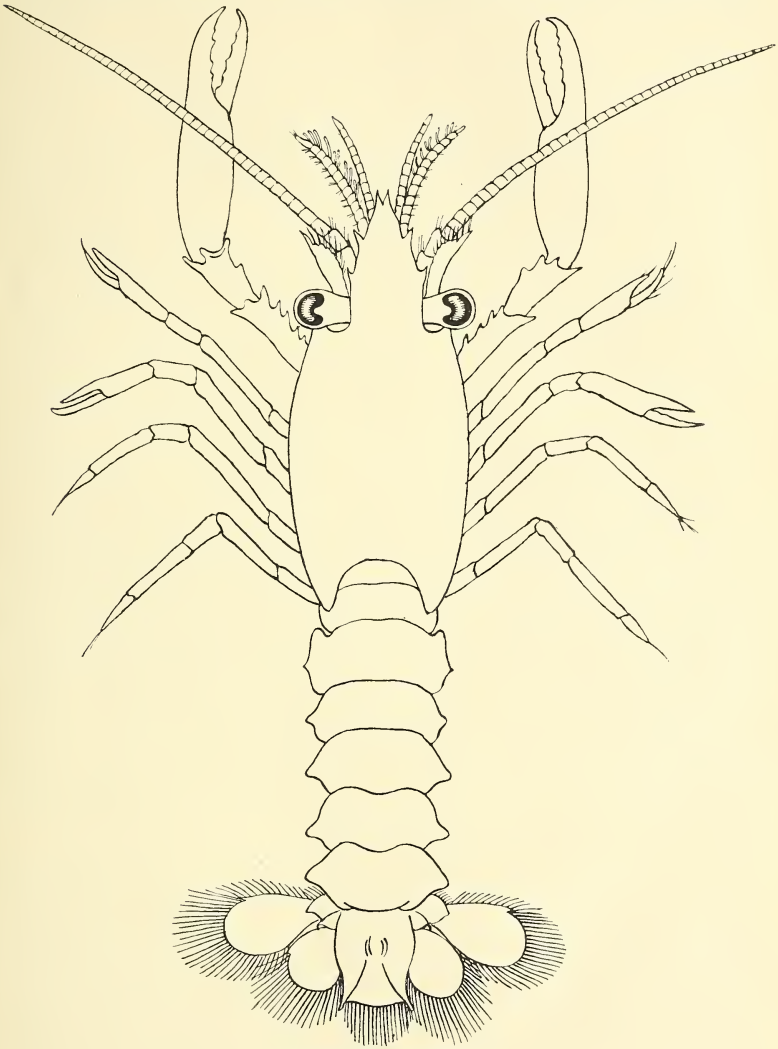
Hatteras, and differs in some small details from those inhabiting European waters. Nova Scotia is the largest producer of lobsters in Canda, where hundreds of fishermen are engaged in this important branch of the fishing industry, and a large number of the lobsters caught are marketed in the canned form.

Amongst the European varieties is the small Norway lobster, or Dublin prawn as it is sometimes called, which inhabits the muddy bottom of the deep waters of the Irish Sea. This is a comparatively small animal, but very beautifully marked with red and white, has large kidney-shaped eyes and long slender claws. Its small size, however, renders it of little commercial value. Another species, the spiny or rock lobster, or sea crawfish, is found on the south and south-west coasts of the British Isles and is much esteemed as a food in France.

We now come to the most important and famous of all—the ' Common Lobster,' which lives off the coasts of western Europe, from Norway to the Mediterranean, in comparatively shallow water, where the sea bottom is rocky and the nooks and crannies afford suitable hiding places. The crustacean is an agile, cunning, and pugnacious animal with sedentary habits and a keen sense of smell and touch. It does not stray far from its haunts and any movements are governed by abundance of food and the temperature of the water. Shunning excess of light it is most active at night, exploring and digging up the sea bed in search of small shellfish. The food of the lobster chiefly consists of fish, molluscs, such as clams or mussels, shrimps, starfish, eel-grass, and seaweed, and although often called the ' scavenger of the sea ' it probably prefers fresh to stale food, and like the owl rejects the bones and other indigestible portions of food eaten. Lobsters appear to have long intervals between meals and eat ravenously when any food is found, and will sometimes tear off and devour the eggs carried by the female. These voracious habits in all probability account for their being so easily caught in baited traps.

When travelling over the sea bottom the lobster walks on the tips of its slender legs, holding the nipping claws raised in front, at the same time waving its antennæ or feelers aloft and turning its protruding eyes in every direction. When seeking a suitable burrow in which to hide, the preliminary examination of any likely crevice is made with the long feelers, the great claws being afterwards inserted. If no enemy is found lurking within, the lobster takes possession by turning round and backing quickly into the hole where it lies motionless with its large claws close together near the entrance and its feelers waving slowly to and fro. When the

lobster is alarmed it opens and shuts its claws, and instead of proceeding forward suddenly shoots backwards a surprising



**Fourth Stage Lobster.**
(magnified 5 times)

distance, by the convulsive and powerful strokes of its tail, sometimes at the rate of twenty-five to thirty feet per second.

The lobster captures its prey by stealth, and hidden beneath a bunch of seaweed, or tucked away in a crevice amongst the rocks, waits until its victim is within striking

distance of its claws, when the fatal blow is struck. The prey is then seized between the thumb and finger-like grasp of the large claw and held securely by the small one, while it sucks away at its leisure.

The fighting habits of lobsters are not confined to their enemies, but they also fight amongst themselves, often losing legs and claws in the fray. As showing their pugnacious nature it is recorded that 200 lobsters were placed temporarily in a tank and after twelve hours only seventeen of them were left with complete sets of legs and claws. ' The main motive of a lobster's activity is defence-caution, and in defending itself a blind unrelenting vengeance is a fitting corollary.'

The colour of the common lobster varies according to the situation from which it has been taken, but is usually a beautifully cloudy mottled dark blue to bluish-black, nearly black on the back and shaded off into orange-yellow on the underside. The colour is produced by a pigment known as ' Zoonerythrin ' which changes to a nearly uniform bright red (including the eggs) when it is boiled, the heat causing a chemical action to take place. Occasionally lobsters are trapped which are bright red in colour.

The lobster's body and limbs are encased in a strong, stoney, shell-like armour, which really consists of four layers pierced by delicate channels. This armour, which is termed ' chitin,' is thin and soft at the joints, allowing free movements of the parts. It not only protects and gives support to the internal organs, but also affords points of attachment for the muscles by means of which the animal moves, and acting as a sort of outside skeleton called the ' exo-skeleton.' Although the lobster is enclosed in this shell case it is sensitive to changes of temperature and its sense of touch is not impaired, as the minute hairs of many sorts and sizes all over the body and limbs detect slight movements and vibrations in the surrounding water.

The fore part of the shell is in one piece, but the hinder portion has jointed segments, each having beneath it a pair of fin-like limbs called ' swimmerets,' the last pair forming the tail fan. Attached to the fore part of the body are the four pairs of true walking legs, and in front of these the large powerful pair of nipping claws, which are not alike in shape or size. The large claw has the fingers armed with blunt round knobs and is adapted for crushing small shell-fish, whilst the small one has the inner edges of the fingers sharp and set with claw-like teeth and is used for holding or tearing prey.

In front of the head are the antennæ or feelers and the antennules. The former play a great part in the life of the animal, enabling it to guide itself, and the latter, probably the seat of the sense of smell, to find its food, but it is very

doubtful whether the lobster has any sense of hearing. The eyes are set on movable stalks in front of the head and can be turned in every direction, but the adult is practically blind.

A curious feature about the lobster is that it can voluntarily cast its limbs. Should one of these become injured or seized during a fight, the lobster can, by causing a spasmodic contraction of certain leg muscles, surrender the limb, separation taking place between the fused second and third joints. After a time a new limb begins to grow and further growth takes place each time the lobster moults until finally a perfect new limb is formed. Occasionally, however, malformation occurs.

The shell-like covering of the lobster does not increase in size or stretch to any appreciable extent and only permits a very limited growth, so that it becomes necessary for the animal to cast its shell entirely at certain intervals and more frequently when it is young. As the time of moulting approaches the lobster appears uneasy and shy, and seeks shelter. The shell undergoes peculiar changes and loses its bright colour. The soft membrane between the shell covering the fore part of the body and that of the tail now splits, and it is through this gaping slit that the lobster pushes itself. By vigorous tugging of the muscles of the limbs the body is gradually worked loose.

The large claws, which are soft and pliable, are withdrawn like the hand from a glove, the tail being the last part to come away, leaving the cast shell and its appendages entire and resembling a dull, live lobster. Should the shell be too hard or rigid for the animal to escape, death occurs. The covering formed beneath the old shell before moulting has a fresh and bright colour, but the flesh is soft and flabby and afterwards rapidly increases in size owing to the absorption of water.

After moulting the lobster wanders helplessly about in its soft coat, diligently seeking food containing the necessary lime for hardening its coat, but if this is scarce it does not hesitate to eat its cast-off shell. It is at this period that the lobster is most liable to attack from its enemies, which include the dogfish, skate, sharks, rays, cod, and sometimes its brother lobster. The newly-formed shell gradually hardens by the deposition of lime salts, but it takes six to eight weeks before the shell is really hard.

Adult lobsters as a rule cast their shell during the months of July, August, or September, the increase in the size of the body is manifest and varies from 13 per cent. to 15 per cent. of the lobster's length. A lobster 10½ in. in length is about five years old and has probably moulted twenty-five times. During the first year it moults about eight to ten times, five

to seven times in the second year, three to four in the third year, two to three in the fourth year. After five years the female moults annually and the male twice a year.

The sex of the lobster can be easily distinguished. The male, or cock, is more slender than the female, and possesses stronger and larger claws in proportion to the body. The abdomen is five-jointed and has two additional claws or ' daggers ' as they are sometimes called. The female, or hen lobster, is smaller generally, the abdomen broader, has deeper side plates and is seven-jointed. She becomes sexually mature when eight to twelve inches long and usually lays one batch of eggs a year. When carrying eggs she is called a ' berried hen ' or ' hen in berry.' It is said that 80 per cent. of the females lay their eggs, which are fertilised outside the body, during the months of July and August. The globular eggs, which measure one-sixteenth of an inch in diameter, are olive green to greenish-black in colour—have a little clear area at one end—and may number from three thousand to one hundred thousand, according to the size of the lobster. They are attached, or hang in bunches, to the swimmerets and are so carried until they hatch. When a hen is ' in berry ' she usually seeks the rocky shore where she can better protect herself. A period of from nine to eleven months elapses between the time the eggs are deposited and hatching, temperature playing an important part in the process. During incubation the swimmerets are kept constantly waving backwards and forwards, thus aerating and cleansing the eggs, and at the same time facilitating the escape of the fry when hatching takes place. The newly-hatched free swimming larva differs considerably in general appearance from its parents. It has a short, stout, shrimp-like body, with a row of spines on the back, a pointed snout, and long feelers. The body is generally blue in colour, but some parts are transparent and dotted with red. The very large gleaming emerald eyes contain in life a white iridescent pigment and the sight is good as compared with the poor sight of the adult. The claws are at first hardly larger than the body, the nipper claws developing after the third week. The larva uses its feathery feet as paddles, enabling it to swim and live near the surface of the sea. It moults about the second day after hatching, and the first three weeks of its life is termed the ' Zoea ' period. About this time the little lobster is exposed to many dangers, its helpless condition, conspicuous colouration, and fairly large size results in its extensive destruction, being an easy prey for a host of enemies, which include the cod and mackerel. The larva generally feeds at night and lives on minute marine animals and plants, etc. It also has cannibalistic tendencies.

There are two well-marked stages in the life history of the larva, the first being the surface swimming stage and the second where it loses these abilities and sinks to the bottom of the sea. Between these main periods there are several intermediate stages of growth during which it moults five or six times. The rate of growth is given by some authorities as follows :—

| | |
|---|---|
| 3 months ... ... ... | $1\frac{3}{8}$ in. long. |
| 10 months ... ... ... | 2 in. long. |
| 1 year ... ... ... ... | $2\frac{1}{16}$ in. long. |
| 2 years ... ... ... ... | $4\frac{1}{2}$ in. long. |
| 2 years and 4 months... ... | $4\frac{7}{8}$ in. long. |

The parent lobster has sometimes been observed with the larvæ. One observer records seeing an old lobster with her head peeping out from under a rock, the young playing about around her. On his approach she appeared to give them warning by rattling her claws, the young then seeking shelter under the rock.

When about two months old the larvæ is about $\frac{3}{4}$ in. in length, and although still able to swim, the feathery-like paddles gradually diminish in size. Later the transparent-like appearance disappears and the body darkens in colour, denoting that the young lobster is about to descend to the bottom of the sea, where in course of time it gradually assumes the habits of the adult, seeking the protection of stones and rocks under which to shelter from the attacks of enemies. It is an interesting fact that if a young lobster about three in. long is taken out of the water it will straighten itself and remain stiff, feigning death. This rigidity does not cease immediately on its being placed in the water. The inert condition produced is supposed to be useful in protecting itself against fish which prefer live food.

Lobsters are in season all the year round, but are considered to be in the best condition during the summer months, when they are also most abundant. The important fisheries are in Norway, Scotland, Ireland, the North-east and South-west coasts of England, Heligoland, and parts of the coast of Northern Europe. They are caught in creels or pots of wickerwork, hemispherical in shape, with a funnel-shaped top, or hoops covered with netting having funnel-shaped openings permitting entrance but preventing escape. The traps, which are baited with pieces of stale fish such as small herring, halibut, hake, or codfish heads, are sunk to the sea bottom, their position being marked by buoys. The lobster's curiosity is sufficient to encourage it to ' walk into the trap,' but the latter being baited stimulates this desire. As the animal has not a very high degree of intelligence, where escape from captivity is concerned, it remains in the pot.

Under Fisheries (Oysters, Crab, and Lobster Act), 1877,

it is illegal to take, have in possession, sell, expose for sale, buy for sale, any lobster which measures less than eight inches from the tip of the beak to the end of the tail when spread as far as possible flat. Lobsters are sometimes caught weighing as much as fifteen pounds each, but the European variety rarely reaches ten pounds. Occasionally a giant-sized lobster of twenty-eight pounds weight, having a length of two feet from beak to tail is trapped. The average weight sold in the markets is from one to two pounds. Lobsters are sent to the market alive in wooden boxes and packed in heather or seaweed.

The flesh of the cock lobster is considered more delicate for eating than the hen. The indication of a good and fresh condition is a clear hard shell with the flesh plump and firm. After being cooked, the tail, on being pulled out, will spring back sharply. The groans and cries when a lobster is plunged into boiling water has from time to time been the cause of much discussion. The crustacean, however, possesses no vocal organs and the noise is caused by the forcible ejection of air bubbles from crevices in the shell due to expansion by heat. The most humane way of killing a lobster is to place it in cold water and gradually raise the temperature. Loss of consciousness quickly ensues and the animal has a painless death.

The esteem in which the lobster is universally held as a delicate food is indicated by the numbers brought to market. During 1931 the numbers of lobster of British taking landed in England and Wales was 734,000, to the value of £44,439, and the quantity and value of canned lobsters imported into the United Kingdom during the same year was 29,150 cwts=£327,764.

## THE ATLANTEAN CONTINENT.

(See pp. 34, 67, 140 in volume current).

Mr. Forrest has submitted to us further reiterations of his views regarding post-early Pleistocene collapse of the North Atlantic Reigon. We are unable to spare the space for all this, but the Reviewer to whom they have been passed sends the following additional note : ' Mr. Forrest's statements concerning the Bermudas are controverted by the details of the Bermuda boring (see *Amer. Journ. Sci.*, vol. 38, pp. 189-206). This boring started at 135 feet above sea level and continued down for 1,413 feet. It recorded only 380 feet of marine limestone, so that this rock extends only to 245 feet below sea level. The age of the lowest limestone is probably upper oligocene. The rest of the boring revealed about 300 feet of broken lava fragments and then massive compact basaltic lava.'

' The author's view that pre-glacial and post-glacial sea levels round England were similar is possibly correct, but has he considered what the effect would be of a collapse of 12,000 feet over the whole Atlantic area between the shelves extending from Bermuda to Iceland ? A simple calculation shows that such a collapse would result in a world-wide fall of sea level amounting to 350-400 feet.'

' Furthermore, the available soundings of the N. Atlantic are emphatically not sufficient to warrant the tracing of structures of the size of river valleys above the deep ocean floor.'

# A COURTSHIP INCIDENT IN VIPERA BERUS.

E. B. LOTHERINGTON.

MANY of us, in the course of a moorland walk on a hot summer's day, have been aware of a sudden movement, and caught a glimpse of the disappearing tail of that shy reptile, the Viper. But during the breeding season, like so many other creatures of the wild, they lose much of their shyness, and give better opportunities for observation.

On April 27th last year I set out on a viper hunt down Burn Howe Dale. This is a short rounded valley leading from the Whitby high road to Jugger Beck, clothed with heather and bracken on each side, a little stream at the bottom fed by small springs and bogs ; quite an ideal place for these creatures.

Patient search had discovered two separate males (males are much commoner than females in this district), neither arrayed in their full wedding garment as yet, when right at the end of the valley under the shelter of Wragby Wood, I was rewarded by an intimate glimpse of viper courtship.

On the hillside was a small bog ; beyond this a yard or so of short grass ; then a mingled clump of heather and bracken about eighteen inches high, with a length of five yards and a width of three. On the grass, in the shelter of the heather, was a peculiar ball which at a little distance seemed to be two or more vipers intertwined, but at my cautious approach broke into a group of four. One of these, a very large fellow, had the most extraordinary colouring, the usual black markings being imposed on a bright lemon colour. This one, which had evidently recently cast a skin, moved leisurely a few yards up the hillside, then proceeded to bask in the sun in full view, and took no further interest in the subsequent happenings. It would almost certainly be a male, but there was no opportunity of handling it to make sure.

A glance was sufficient to shew the sex of the rest. One was a very large female, dull olive in colour, faint in marking, and very sluggish. She never moved from the spot the twenty minutes or so they were being watched.

Of the other two there was equally no doubt that they were males in the most brilliant breeding colour, silver grey with the blackest of black markings, and of average size. They disappeared at once in the tuft of heather.

For some three minutes nothing happened. Lemon and olive were basking quietly, oblivious of my presence. Then there was a stir in the clump behind, where the two males were, and first one head and then another appeared, followed by the whole body. After a short time they began to move

about restlessly and slowly, taking short turns. Then as if moved by a common impulse, they began to rush wildly the whole length and back of the clump ; not over the surface, but weaving in and out in the most extraordinary manner, and at a speed no one would credit it possible for a viper to attain. They were evidently in a state of great excitement, the more easily realised when it is remembered how placid is their ordinary life (sometimes they will lie for a whole day with the slightest change of position only). This play or movement was kept up at high speed for over ten minutes with very short independent intervals, and during that time neither of them interfered with the other or appeared to resent its presence in any way. There was certainly no sign of rivalry. Movement and colour combined made a fascinating sight. Then, more suddenly that it began, the play was over and the performers disappeared again.

Perfect quietness reigned for about five minutes. Then, with a peculiar sideway staggering motion, one of them reappeared, and slowly made straight for the female, tongue quivering in and out at great speed. He glided up alongside, touching her body for the whole length with his tongue. Then he climbed on her back, full length, and for a minute or so there was a most peculiar motion, a tense quivering, which can perhaps best be described as if all the vertebra were dislocated and moved separately sideways. It is fairly certain that there was no actual sexual union, the position differing greatly from other pairs I have seen, and indeed it would be impossible in the way described ; so that what was being witnessed was a passionate act of courtship. All this time the female never moved or made any recognition, although there was no resentment shown. Only complete indifference.

Finding no response, Silver Grey left the female, and unhurriedly came to investigate the watcher ; another unusual occurrence. No claim for a savage attack can be made, however, for as soon as his tongue touched the protecting stick in front of my shoe, he turned at once and fled.

The behaviour of the female was also peculiar. On picking her up she neither struggled nor hissed, nor on being put down made the slightest attempt to get away. If all the other three, as is probable, were males, it is likely she was somewhat exhausted. Then again, the time of skin casting might be near, when they are always sluggish for a day or two ; although the tell-tale whitening of the eye scales was not observed.

A grouping of four vipers, like this, is not unusual in the breeding season. I have seen a group of five ; but the usual one is of three, two males to one female, which is much more common than that of a single pair.

# FROM A MICROSCOPIST'S NOTE-BOOK.

W. LAWRENCE SCHROEDER.

On May 28th, some years ago, I took *Chlamydomonas* from a very foul-seeming trough at Dean Head. A couple of days later I made a vaseline life-slide of a drop of the stuff, and in three days the slide was swarming with an exceedingly lively crowd, clustered at the edge of the water-film nearer the window. I turned the slide so that the bare part of the film should be nearer the window, and the response to the light was immediate. I turned the slide several times, and kept my eye on the creatures under the microscope tube. It was fascinating to watch the streaming of the *Chlamydomonas* towards the stronger light. My room is well-lighted, and the vaseline circle was only about half an inch in diameter. But within that distance, the response to the light was most marked. I kept the slide for four weeks, but at the end of that time, all the creatures had died down.

One of the most remarkable of my experiences in collecting pond-life stuff was in 1917. On May 24th, I took a small quantity of stuff from a little puddle made by a cow's foot, and served by a tiny stream which was evident only in—and immediately after—rainy weather. In the tube could be seen a young larva of *Stratiomys chamoeleon*, three colonies of *Carchesium polypinum* and a number of Cyclops—larval and adult.

I made three vaseline life-slides ; two of them showed an amazing abundance of life : *Spirogyra varians* ; *Oscillatoria tenuis* (c. 5$\mu$ wide, with faint markings), *Cylindrospermum stagnale*, *Merismopedia glauca*, *Keratococcus rhaphidioides*, *Closterium Ehrenbergii*, *C. lunula*, *C. striolatum* (some of them showing as many as four girdle-bands, indicative of the number of generations of the semicells), *Staurastrum punctulatum*, *Roya obtusa* (var. *montana*), *Cosmarium cucumis*, and a *Cosmarium* (probably *corbula*). Among Diatoms were *Navicula minuscula* (c. 10$\mu$ long and 4$\mu$ broad), a *Navicula* (probably *rhomboides*), *N. rhynchocephala* (c. 40$\mu$ long), *Pinnularia viridis*, *Stauroneis Phoenicenteron* (var. *amphilepta*), *Synedra ulna*, *Eunotia exigua*, *Cymbella* (*cocconema*) *parva*, *Surirella linearis*, *S. Smithii* ; and some very minute forms, mostly *Naviculae*, that I could not rightly identify.

On many of the diatoms I was able to focus the $\frac{1}{12}$ in. objective, for the determination of the markings.

The animal life was also abundant and varied : *Amoeba* (*proteus*), *Astasia limpida* (with a very little flagellum), *Anisonema sulcata* (28$\mu$ by 16$\mu$), *Monas socialis*, *Difflugia proteiformis* (in fine active condition ; the pseudopodia showing well on a dark background), and *D. acuminata* (var.

*inflata*). There were two or three extremely small ciliates I was unable to identify, and also a number of minute flagellates (some in division) that eluded me.

*Vorticella* (sp.) was on one slide ; and also a good number of *Trachelomonas hispida* (c. 30$\mu$ long, 20$\mu$ wide, and with *flagella*, c. 35$\mu$ long). The red eye-spot was very distinct. A few of the creatures were somewhat narrower and longer than the rest. The reddish outline, the green contents, and the general fussiness of the creatures made them an interesting sight. Two of them were feeding on what seemed to be the encysted stage of Euglenae. They also bobbed about one of the big Euglenae while it was quiet.

There were at least three species of *Euglena* : *E. pisciformis*, *E. elongata*, and *E. acus* ; but the great find was *Euglena spiroides*—a vision of delight as it worked its way in a spiral fashion through the water. There was one full turn in the spiral chlorophast ; the membrane was marked with dots in regular rows. One specimen was c. 100$\mu$ long and c. 12$\mu$ wide ; another somewhat larger was c. 126$\mu$ long and c. 18$\mu$ wide.

One of the slides showed most—if not all—the stages of *Vampyrella lateritia*, one of the Rhizopods. There was the encysted stage, with reddish centre and clear circumference ; there was one stage showing ' spore-like ' formation with four spindle-like elements ; and there was also the fully developed form with ray-like pseudopodia, like a sun animalculum with a reddish tinge. I was fortunate in seeing the emergence of the amoeboid form from a cyst, and also in seeing a form with somewhat definite lobe-like pseudopodia at one end, make its way through an opening in an empty desmid, *Closterium striolatum*, whose chloroplast apparently it had devoured. There were also on the slides several *Rotifer vulgaris*, some good specimens of *Chaetonotus larus*, the nematoid *Anguillula fluviatilis*, several *Oxytricha* (one of the hypotrichida infusoria), and *Vortex* sp. (now *Dalyellia*)—one of the Turbellaria.

In the cow-foot puddle gathering—filling a small collecting tube—there were at least forty-five different species of plants and animals. Most of the specimens here mentioned were on two of the life-slides made. I spent hours in their examination, for the stuff remained healthy for nearly three weeks. In the bottle, the *Cyclops* multiplied, and made sad havoc among the more minute forms of life ; but the desmids and diatoms flourished. I have read of wonderful collections taken from rain-puddles on an ill-paved road, from roof-gutters, water barrels and the like ; but for variety, and interest I would modestly claim the Shibden Valley streamlet puddle yield to be extremely worthy of record in the pages of a responsible scientific journal such as is *The Naturalist*.

# In Memoriam.

## F. A. BATHER, D.Sc., F.R.S., F.G.S. (1863-1934).

THE news of the death of Dr. Bather which took place after a short illness on March 20th will come as a shock to many of his friends. Though he had passed the three score years and ten, he was more active and healthy than most people

of half his age. I first made his acquaintance in the British Museum forty years ago when Dr. Bather and his colleagues were anonymously editing *Natural Science*, one of the finest scientific journals which ever appeared in this country. Since then we have met frequently every year in connexion with the British Association, the Geological Society of London, the Museums Association, or other institutions, in all of which Dr. Bather took a prominent part, having been President of important sections of the first named, and of the Geological Society and the Museums Association. He was probably the greatest authority on Fossil Crinoids. He was educated at Winchester and at New College, Oxford, of which he was a Scholar. He entered the service of the British Museum in

1887, was Deputy Keeper of the Department of Geology from 1902-1924, and Keeper from 1924-1928. Although he was essentially a specialist, no one took a greater interest in museum administration. He had a high opinion of the position held by museums, and did his utmost to help with regard to their work in every possible direction. Probably his most interesting contribution on museum matter generally was his Presidential address to the Museums Association when he took for his subject ' The Functions of a Museum.' He was a prominent member of the Palæontographical Society ; for many years was Editor of *The Museums Journal,* which he brought to a high standard ; and was the recipient of many awards of medals not only from the Geological Society of London but from America and other places. He leaves a widow, two sons, and a daughter, to whom we extend every sympathy.—T.S.

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## JOHN CLAYTON.

On the 20th December John Clayton passed away at Harrogate in his 88th year and was interred at Allerton, Bradford. Before leaving Bradford for Harrogate more than thirty years ago he was an active member of the Bradford Naturalists and Microscopical Society. He was President in 1887 and acted as Treasurer for eight years from 1892 to 1899.

His special subject was Botany, and in that he worked on somewhat original and varied lines. In 1886 he prepared a very full and interesting pamphlet on ' The History of Botany,' which indicated wide research. Starting with Solomon as the first recorded botanist—' according to Josephus and the Book of Kings, he spake of trees from the Cedar that is in Lebanon to the hyssop that springeth out of the wall.' He then jumped to the fifth century B.C. and from then gives a succession of botanists and their work down the ages from the Eastern nations to our own day. Short biographical notes are given of many of the more noted botanists.

His paper ' On the Effects of the Weather on Vegetation ' was a record of long and careful observation. A paper on the ' Cowthorpe Oak ' was published in the *Transactions of the Botanical Society of Edinburgh* in 1903 and was the most exhaustive and carefully prepared account of this—the largest of the oak trees in Britain. It was freely illustrated with photographs and drawings. Copies were deposited in the Free Libraries of Bradford and Leeds, the British Museum, the Linnean Society, the Philosophical Society in Leeds, and the Yorkshire College. He planted a few acorns from the old tree in his garden at Bradford and when well developed he planted one near the old tree and had the assurance of the

farmer, the land owner, and the Rector that it would be cared for. It is now a good-sized tree and may for centuries carry on the fame of its parent.

In 1888 he wrote a very full paper on Pinus Sylvestris—the Scotch Fir—illustrated with drawings, made under the microscope, of structure and reproduction. In 1896 he wrote a very exhaustive account of Sequoia gigantea, one of the giant trees of California, with special reference to the specimen in the Natural History Museum, London, and of a segment from that specimen which he obtained from the authorities of the Museum and which he prepared for exhibition and gave to the Bradford Museum. A few copies of the paper, illustrated with photographs and reproductions of microscopic slides, as well as exhaustive figures of the results of tests were given to a few of his friends.

These are a few of the subjects to which he devoted himself and form a fine record of originality and unlimited patience. —E.N.

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## E. B. LOTHERINGTON.

For the third time in twelve months the Scarborough Field Naturalists' Society has suffered the loss of a member of outstanding usefulness.

For more than thirty years E. B. Lotherington, who died very suddenly at his home in Scarborough on April 12th, was an active member of the Society. Except for a period when he paid special attention to the fresh-water algæ he did not pursue systematically any one branch of Natural History. Yet few men that I have known had so profound a love for the country or so wide a knowledge of its varied forms of life and interest. He would never claim to be an 'expert' or specialist. His attitude was far more that of the philosopher naturalist. He was not a collector of things, but of facts concerning the lives and ways of wild creatures, and of these facts he had an amazing knowledge. Nobody who ever had the pleasure of his company could fail to be impressed by the width of his sympathy and shrewdness of his observation and judgment.

But the moors, and the wild life of the moors, were Lotherington's special delight, and for those of us who knew him well his memory will always be associated with the wide, open spaces of our ling-clad uplands. No one knew the moors better than he; no one loved them with so deep and understanding a love. Every aspect of them appealed to him; the birds, the trees, and flowers; the remains of the ancient human cultures; the lives and problems of the dalesmen. He was specially interested in the distribution and habits of

the viper, and for many years past had been making an intensive study of that interesting creature. Only a week or two before his death he was discussing with me in the field (he found on that cold March day seven separate vipers basking in the sun) some interesting details about the seasonal change of colour ; and he hoped, during this season, to complete observations that might clear up several problems not only regarding the colour change, but also connected with the breeding habits.

Lotherington was a man of outstanding personality and charm. He had the true gift for friendship. He loved to talk to the country folk, and his modesty, simplemindedness, tact and courtesy, and his acts of kindness and generosity will be remembered by everyone who knew him. He hated cruelty in any form. ' Cruelty,' he once said to me, ' is the one act of immorality that has no excuse.' I think it was this sensitiveness to suffering, whether of men or dumb animals, that made him so sensitive to beauty. He was particularly fond of trees and had a wide knowledge of their culture. ' I think trees are the most lovely things in nature,' he remarked one day when we were standing among the Scotch Pines that he had planted around the bungalow which he built with his own amateur hands at Ravenscar.

That bungalow became the rendezvous of local naturalists —a centre from which the beauties of moor and dale were visited and studied ; and round whose peat fire after the day's tramp, there arose discussions, the memory of which, linked up with the memory of one of the most beautiful natures one can ever hope to know, will remain for many of us a joy and a pain to the end.

In business life Lotherington was a manufacturer of whitening and managing director of brickworks. Many of the finest fossils from his quarry in the Middle Chalk at Middleton, notably a fine series of sponges, were presented to the Hull Museum. He passed away at the early age of 54, and leaves a widow and daughter to mourn his loss.— E. A. Wallis.

[In this number we print what we hoped would have been the first of a series of articles by Mr. Lotherington on the Viper. His untimely death is a great misfortune for North-country naturalists.—The Editors.]

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## NORTHERN NEWS.

A useful Subject Index to the Geological Literature of 1923-1924 has recently been published by the Geological Society of London. The somewhat late appearance of the lists for these particular years is explained.

# YORKSHIRE NATURALISTS AT FARNDALE.

The meeting at Farndale was arranged for a survey of the area which will be submerged when the proposed new reservoir of the Hull Corporation is completed ; Church Houses, the meeting place, is a long way from the railway, but in spite of this and of the early date, April 14th, the attendance was far greater than expected. Mr. T. H. Jones, of the Hull Corporation Water Department, gave an interesting and very useful description of the water scheme and supplied those in attendance with sketch plans of the area showing the position of the dam and the water level when full.

Mr. D. W. Bevan writes : The approach to Farndale by bus from Kirbymoorside (200 ft. O.D.) is full of interest. The road ascends rapidly (against the natural dip of the rocks) over the Limestones and Grits of the Middle Oolites till Gillamoor (500 ft.) is reached, when suddenly a grand panorama of the whole range of the Lower Oolites bursts into view ; for that village is on the edge of the escarpment of the Middle Oolites down which the road descends over the Oxford Clay and Kellaways Rock, and quickly reaches the steep face of Farndale, here the River Dove flows over the Lower Lias ; the sharp Rigg is kept by the Dogger ; the steep, upper face is the Upper Liassic shales, showing here and there grey screes, the refuse from old jet workings ; and the humps and convexities lower down indicate the presence of the Ironstone beds of the Middle Lias.

**Botany :** To the botanists the meeting date was ideal for seeing the Daffodils at their best and down stream for two miles or up stream for three miles did not bring us to the end of them, both species of *Chrysosplenium* were in flower but few other plants were in bloom, Celandines, Primroses, Marsh Marigolds, and Anemones were only just opening their earliest buds.

Two plants will vie with the Daffodils later on in similar plenty, the Great Hairy Woodrush (*Luzula sylvatica*) and Cicely (*Myrrhis odorata*). A specimen of *Gagea lutea* was shown which had been gathered at Kirbymoorside but no sign of the plant was noted on the excursion. The roadside walls showed a Moss flora almost identical with that of a Millstone grit area, the main moss being *Dicranoweisia cirrata*, with species of *Grimmia* and *Rhacomitrium*. The stream bed was very free from either moss or hepatic, the only moss seen being *Hypnum plumosum*.

Mr. W. H. Burrell writes : With so large a party to support the day's programme on the dale bottom, a search for *Orthodontium*, as a side issue, seemed justified. The ground chosen was Hanging Bank Wood, oak, sycamore, holly, mountain ash, etc., on the steep western bank of Blakey Gill at 500-600 ft. altitude ; the moor top of Blakey Ridge and the sandstone quarry and mine workings on its western slope, 700-1100 ft. A negative result supports the previous evidence that the moss has not, up to the present time, obtained any considerable hold in the North Eastern division of the county (*Naturalist*, 1932, p. 367). Some of the trees in Hanging Bank Wood were well clothed with mosses including *Ulota crispa* and *Orthotrichum affine* ; *Dicranella heteromalla* and *Dicranoweisia cirrata* in fruit made a brave show ; *Hypnum cupressiforme* var. *filiforme*, *Dicranum scoparium*, *Mnium hornum*, *Plagiothecium sylvaticum*, *Catherinea undulata*, *Polytrichum aloides* and *P. formosum*. *Pellia epiphylla* and *Lophocolea cuspidata* were everywhere.

On the open moorland were seen *Hypnum cupressiforme* var. *ericetorum*, *H. Schreberi*, *Webera nutans*, *Thuidium tamariscinum*, *Campylopus fragilis*, *Dicranum majus*, *Aulacomnium palustre*, *Sphagnum fimbriatum*, *S. cymbifolium*, *Gymnocolea inflata*, *Nardia*

*gracillima, Lophozia floerkii, Calypogeia trichomanis, Ptilidium ciliare* ; a runlet that had been made active by heavy rains of the previous Thursday was filled with great cushions of *Dicranella squarrosa, Sphagnum,* and *Philonotis,* a pleasant spot at which to loiter on so fine a day.

Mrs. Versey gathered an etiolated specimen of *Eurhynchium prælongum* in mine workings on Blakey Ridge, the characteristic habit of the plant being more or less obscured by the colour and lank growth.

**Fungi** (F. A. Mason) : The fungi mentioned in this note were all collected in the fields, hedgerows, and on waterside herbage along the route followed by the main party, and the list has been compiled with the co-operation of Mr. W. G. Bramley and Miss D. Wooff.

Fewer Uredines were met with than might have been expected, even at so early a date, and the species collected were :—

*Uromyces Ficariæ* Lév., on *R. Ficaria.*
*U. Junci* Tul., on dead rushes.
*U. Poæ* Rabenh., æcidia on *R. Ficaria.*
*Puccinia obscura* Schröt., teleutospores on *Luzula sylvatica.*
*P. Caricis* Reb., teleutospores on dead *Carex* sp.
*P. sessilis* Schneid., teleutospores on *Phalaris arundinacea,* doubtless representing the biological race, *Winteriana* Magn., which has for its æcidial host, *Allium ursinum,* a plant that occurred abundantly in the vicinity.

There was evidence among the fallen leaves of Sycamore that *Rhytisma acerinum* was common in the district ; the fungi were now fully mature and the corrugated black spots swollen by the ascigeral stage preliminary to exposure of their pale-coloured discs. Other Discomycetes found were the following :
*Calycella lenticularis* (Bull.) Boud., on Beech wood.
*Orbilia xanthostigma* Fr., on dead chips.
*Helotium lutescens* (Hedw.) Fr., on fallen mossy twigs.
*Dasyscypha diminuta* (Rob.) Sacc., on dead rushes.
*Mollisia* (*Tapesia*) *cæsia* (Fuckel) Sacc. This species has only once previously been found in Yorkshire. Massee's description of this fungus as *Tapesia cæsia* is very graphic in its macroscopical details.
*Trichoscypha calycina* (Schum.) Boud., on larch twigs and branches.
*Phacidium multivalve* (D.C.) on holly leaves.
*Stegia Ilicis* Fr., on holly leaves.
*Coccomyces coronatus* (Schum.) de Not., on oak leaves.

Among the Pyrenomycetes collected were :

*Nectria cinnabarina* (Tode) Fr., on hawthorn.
*N. ditissima* Tul., on ash trunks.
*Hypocrea rufa* (Pers.) Fr., on fallen branches.
*Endodothella Junci* (Fr.) Theiss. and Syd., on dead rushes.
*Rhopographis Pteridis* (Sow.) Wint., on dead bracken.

A few specimens of Fungi Imperfecti were collected, several of which rarely appear in our lists :

*Phoma herbarum* West., on dead herbaceous stems.
*P. samararum* Desm., on samara of ash.
*Vermicularia dematium* (Pers.) Fr., on dead herbaceous stems.
*Leptostromella juncina* (Fr.) Sacc., on dead rushes.
*Dothichiza ferruginosa* Sacc., on larch cones.
*Ramularia Calthæ* Lindr., on *Caltha* leaves.
*Stilbella tomentosa* Schrad., on *Trichia* sp.
*Graphium griseum* (Berk) Sacc., on dead rushes.

Myxomycetes :

*Ceratiomyxa fruticulosa* Macb.
*Physarum viride* Pers.
*Comatricha nigra* Schröt.
*Trichia varia* Pers.
*T. verrucosa* Berk.
*T. lutescens* Lister
*T. botrytis* Pers.
*Hemitrichia Karstenii* Lister

on fallen branches and wood.

**Freshwater Biology** (J. M. Brown) : Mr. Whitehead and the Recorder spent the whole afternoon working at the aquatic life. There was abundance of water in the main stream, slightly acid in reaction, the current was rapid pointing to a high degree of oxygenation, and in most places the bed appeared to be fairly stable, but at some of the bends a considerable accumulation of finer sediment occurred, suggesting a suitable habitat for the burrowing nymphs of *Ephemera danica*, which, however, were not found. In fact, no nymphs of the Ephemeroptera were seen at all in the main stream, and only a single specimen of Bætis was noticed in a side stream. The paucity of animal life was probably accounted for by the scarcity of plant forms other than the micro-flora on the stone surfaces. Stone-fly larvæ were in moderate numbers and were represented by *Perlodes mortoni*, *Chloroperla grammatica*, *Leuctra* spp., *Amphinemura* sp., and *Nemoura* sp., but neither *Perla carlukiana* nor *P. cephalotes* was seen. Adults of *Protonemura præcox* Mort., *P. meyeri* Pict., *Leuctra inermis* Kny., *L. hippopus* Kny., and *Nemoura avicularis* Mort., were obtained but not in any considerable number, and these were mainly males. Trichoptera larvæ also were not very evident, and case-forming species particularly scarce, the web-spinning carnivorous forms being more predominant, and these were represented by *Plectrocnemia*, *Polycentropus*, *Rhyacophila*, and *Hydropsyche*. *Elmis* represented the beetles, and *Cottus gobio* (Bull-head) the fishes.

Some of the small tributary streams with more moss- and algal vegetation, seemed rather richer in animal life. *Gammarus pulex* and *Ancylus* among the stones, and *Velia currens* on the surface of the water occurred though absent from the river, and besides several Caddis- and Stonefly larvæ already noted, *Halesus* and *Silo* (case-forming Caddis), larvæ and pupæ of *Simulium latipes*, larvæ of *Dicranota* and of the small *Orthocladids* (Diptera) were noted.

Few active insects were seen among the vegetation near the stream. Bees were busy among the Sallow blossoms, two or three Sawflies were seen, and only two Hemiptera, *Dicyphus stachydis* and *Anthocoris confusus* were noticed.

Mr. C. A. Cheetham reports : Few flies were seen but by sweeping the daffodils and damp side runlets I got a few species of diptera including *Dixa maculata* Mg., *Boletina gripha* Dz., *Trichocera hiemalis* Deg., *Lonchoptera lutea* Panz., (♀ and ♂), *Scatophaga stercoraria* L., *Tephritis leontodontis* Deg., and a *Phora* which is possibly *urbana* Mg. (*caliginosa* Mg.).

Mr. C. W. Mason writes : The Vertebrate section confined their observations to the area to be covered by water under the Hull scheme, not one spring migrant was observed on this occasion. Lapwings were in the fields by the River Dove but not nesting yet. The Long-eared Owl and Tree Creeper were seen in the woods and the Green Woodpecker was heard, the Dipper was noted along the stream. The best find of the day was a Woodcock nest with four eggs, but considering the fine day it was surprising that little bird life was seen.

A meeting was held at Headquarters after tea, when the President

(Mr. F. A. Mason) occupied the Chair, reports on the day's work were given by Messrs. Whitehead, Brown, Burrell, Versey, and Bramley and hearty votes of thanks were accorded to the landowner, the Earl of Feversham, to the Hull Corporation, to the local Secretary, Mr. G. B. Walsh, and to Mr. Highfield and Mr. C. W. Mason, who acted as leaders.

## REVIEWS AND BOOK NOTICES.

**At Whipsnade Zoo,** by **Gladys Davison, F.Z.S.,** pp. 119, 2s. 6d. net ; Nelson and Sons. This is one of the Discovery Books for children. It is a highly readable account of a visit to Whipsnade, in which the animals converse. Incidentally, it would serve as a convenient guide. The illustrations and form are good, and the book may be recommended.

**Wood Magic,** by **Richard Jefferies,** pp. vi.+380 ; price 3s. 6d. in the 'Swan Library,' Longmans, Green and Co. That this classic, written more than 50 years ago by the great Victorian naturalist writer, has been re-issued in one form or another no less than eleven times, will surprise no lover of the works of Richard Jefferies. Many people will be delighted to renew acquaintances with 'Bevis' and to introduce him to a newer generation. Jefferies possessed the rare faculty of endowing the creatures of the wild with human characteristics without impairing the underlying scientific value of what he wrote. Although the book consists largely of imaginary conversations taking place between Bevis and the animals, birds and insects by which he is surrounded, children who read it all will have little to unlearn when they come to study more formal natural history. It is rather unfortunate perhaps that the spider refers to himself as an 'insect.'

**On the Sea Shore,** by **L. R. Brightwell.** Nelson and Sons, pp. 119, 2s. 6d. net. This also belongs to the Discovery Series. It is an account of the plants and animals of the sea shore, and may be recommended for somewhat older children who are displaying naturalistic tendencies. It would also prove a friend in need for their parents. The illustrations and examples are well chosen. The latter include some microscopic forms.

**Report on the North Sea Cod,** by **Michael Graham** (Ministry of Agriculture and Fisheries : Fishery Investigations, Vol. XIII, No. 4, 1933 ; pp. 190, 7s. net (H.M. Stationery Office). This report deals in full with information available as to Cod in the North Sea. The data presented and discussed include those relating to the growth of the fish, and also to their movements and spawning grounds in the North Sea. There is an interesting chapter on the development of the fish and their food habits and resultant movements at different stages of maturity. The effect of the War is also analysed, and it is shown that as with the Haddock and with Plaice, that the resumption of fishing after the War revealed a distinct increase in the numbers of large Cod. The practical effects of the various conclusions are discussed. This is a distinctly important memoir, and a good example of the methods applied to the study of marine fishes.

**The Atlantean Continent**, a paper by **R. W. Sayles.** *Bermuda during the Ice Age. . Proceedings American Academy of Science,* Vol. 66, No. 11. Gives definite evidence that the Bermudas are not coral islands formed during a gradual subsidence. A deep boring met volcanic rocks at 245 feet below sea-level. The greater part of the group is formed of wind-blown material, and there are beds of marine limestone intercalated with the eolianite. The amount of coral on the Bermudas is negligible. —A. Farrington.

**Suppression of Weeds by Fertilisers and Chemicals,** by **H. C. Long.** 57 pp., 2s. net. Published by the author at 'The Birkins,' Orchard Road, Hook, Surbiton. It is nearly fifty years since the practice of spraying crops with chemical substances was first introduced, Charlock being destroyed by the use of copper sulphate. Since that time it has

gradually become evident that the method has widespread applications. It is evident also that the beneficial effects of many fertilisers are due not only to their causing the crop plants to outstrip the weeds, and hence to suppress them, but also in many cases because the weeds themselves are harmfully affected. The available information on the subject has been concisely brought together by Mr. H. C. Long, of the Ministry of Agriculture. It is a good general account of the methods and principles involved. Not the least interesting part of this brochure is an excellent introduction by Sir Daniel Hall.

**Huxley,** by **E. W. MacBride.** The Camelot Press, published by Duckworth ; pp. 142. The latest of the series of little books on Great Lives to appear is that dealing with T. H. Huxley, who joins Darwin as a representative biologist in this series. Huxley's claims to inclusion can probably be variously assessed by pointing to his work as a morphologist, to his tremendous propaganda in support of the theory of evolution, and to his role as leader of the scientific agnostics, which is probably the aspect of his life most familiar to ' the man in the street.' To the biologist, he appears especially as a great publicist of scientific theories and, most particularly, his place is assessed from his tremendous influence as a teacher. It is astonishing how many of the able biologists of the succeeding generation had come under his influence. Professor MacBride may be complimented upon having presented a very judiciously planned background for all these varied aspects of Huxley's life. But the merit of the book is not only this—it is that the author gives facts and reasons on which to assess the present value of Huxley's work. He shows, for example, not only why Huxley favoured the mechanistic outlook in biology, but, also, why his successors have deserted both his outlook and his conclusions. This is, in short, an excellent little book which every naturalist could profitably read.

**The Rambler's Handbook,** published by Messrs. E. J. Larby, price 6d. ' The Ramblers' Handbook for 1934 ' is a wonderful compilation for sixpence. It is, of course, the official year book of the Federation of Rambling Clubs, and is a perfect encyclopædia of information for those who spend their holidays on foot. Even the advertisements are alluring, listing maps, clothes, ruck-sacs, tents, guide-books, guest-houses, hotels and cheap railway tickets. The handbook is of pocket size and will probably accompany many a rambler this season.

**The Naturalist on the Prowl,** by **Frances Pitt,** pp. x.+138, with 36 photographic illustrations ; Country Life, price 5s. Any book on natural history from the pen of Miss Pitt is sure of a hearty welcome, and this volume is of special value, as it deals with the author's methods of watching and photographing wild life. The advice on dress, equipment and general methods will be found to constitute a most useful guide to the novice. The remarks on ' hides,' which are the outcome of nearly thirty years experience of bird photography, should prove very encouraging to those who want to emulate the great nature photographers. Years of experiment have resulted in much simplified equipment, and even the camera itself need not be a costly complicated affair. The reviewer is pleased to note that Miss Pitt recommends the despised motor car as a suitable hiding place from which to observe wild life. It is surprising how little notice most birds take of a saloon or covered car, provided the people in it do not get in and out and slam doors. If the windows are kept clean, binoculars may be used perfectly well from inside, and what is more important, most ordinary birds will come close up to a stationary car without any signs of alarm. Miss Pitt's account of a Blackcock ' tournament ' seen from a car will convince the most sceptical. The photographs are really good, and the author is to be specially congratulated on those of the Dotterel and Greylag Goose. The latter most wary bird was photographed once only, although a motor expedition of 600 miles had been undertaken to do this !

# CORRESPONDENCE.

## PROTECTION FOR THE HERON IN THE WEST RIDING.

To the Editors of *The Naturalist*.

Dear Sirs,

As the honorary secretary of our Wild Birds and Eggs Protection Act Committee is abroad, and will be likely to remain there for some time, and as the minute book of this committee is not available, it has been thought advisable to ask you to publish the following correspondence.

Yours faithfully,
H. B. Booth, *Chairman*
(Wild Birds and Eggs Protection Committee
of the Yorkshire Naturalists' Union).

[Copy]

County Hall,
Wakefield,
*6th February*, 1934.

Dear Sir,

Wild Birds Protection.

The County Council have been asked by a Fishery Board in the West Riding to remove the Heron from the birds protected by the Order in force in the West Riding for a period of five years owing to the fact that the number of Herons has increased enormously and that they are doing very considerable damage to fish, especially salmon, sea trout, trout and young fish. I shall be glad if you will let me have your observations upon this application, and particularly if you can inform me of the number and situation of any Heronries in the West Riding of Yorkshire.

Any observations which you have to offer as to the damage done by these birds would be appreciated.

Yours faithfully,
J. Charles McGrath,
*Clerk of the County Council.*

Fred Edmondson, Esq.,
Utley, Keighley.

[Copy]

Ben Rhydding,
*February 11th*, 1934.

The Clerk, The W.R.C. Council,
Wakefield.

Dear Sir,

*Re* Wild Birds Protection.

Your letter of February 6th, addressed to Mr. F. H. Edmondson (who will be abroad for several months) has been sent on to me. In reply, fortunately a meeting of the W.B. and E.P.A. Committee of the Y.N.U. had already been called for Saturday next (February 17th), when I will read your letter, and bring the matter up for discussion, and let you know the result. It is news to me that Herons have *increased enormously*. The number of their nests in 1933 in the whole of the West Riding was under fifty, which cannot be considered excessive. If there is any marked increase at all, it must be in the young birds, and due to the mild winter, as hard and continued frosts are very destructive to the birds of the year, who have not the experience to make for the sea, and other open waters.

Yours very truly,
H. B. Booth
(*Chairman W.B. and E.P.A. Committee of the Y.N.U.*).

[Copy]

County Hall,
Wakefield,
*12th February*, 1934.

Dear Sir,

Wild Birds Protection.

I thank you for your letter of the 11th instant and shall be glad to hear further from you after the meeting of the Yorkshire Naturalists' Union on Saturday next.

Yours faithfully,
J. Charles McGrath,,
*Clerk of the County Council.*

H. B. Booth, Esq.,
' Ryhill,'
Ben Rhydding,
Yorks.

[Copy]

' Ryhill,'
Ben Rhydding,
*February 23rd*, 1934.

The Clerk, The W.R.C.C.,
Wakefield.

Dear Sir,

Wild Birds' Protection.

With further reference to your letter of February 6th, 1934. This was read to a full meeting of the above Committee on February 17th, and after full discussion the following resolution was passed unanimously :

' That this Committee cannot recommend the suspension of the total protection of the Heron in the West Riding for a period of five years, as requested by a West Riding Fishery Board.'

They wished me further to point out that we do not agree that Herons have *increased enormously*. The total number of nests in the whole of the West Riding in 1933 did not exceed fifty, which cannot be considered to be excessive. Any slight increase is in young birds, and is chiefly due to this very mild winter. Some thirty years ago this same Committee had to request the W.R.C.C. to protect the Heron during the whole of the year, as their numbers were being so greatly reduced.

Although the Heron lives chiefly upon fish, it is very partial to eels (which do much damage to fish spawn), and it eats great numbers of frogs. It is also useful to man by the fact that it devours numbers of young and adult rats, voles and mice ; and it is practically the only check on the increase of the Water Shrew, which latter lives chiefly on small fish ' fry.'

It must not be forgotten that the Heron is our largest and most stately native bird, and to many a town-bred man or woman the sight of a living Heron in the country is one of the sights of a lifetime. If all protection were withdrawn from the Heron, in five years it might be exterminated in the West Riding, which would leave a blot on the W.R.C.C. and on this Committee that would never be wiped out.

This Committee will be glad to be of any further service to you, and we have not any wish to see the Herons increase unduly.

Yours very truly,
H. B. Booth (*Chairman*).

I was verbally informed that the General Purposes Committee of the W.R.C.C. had declined the request of this Fishery Board, and had ordered the list of protected birds to be printed exactly as that of 1933—so that the Heron is still protected the whole year in the West Riding ; also its eggs.—H.B.B.

## NEWS FROM THE MAGAZINES.

We see from the *Sixth Annual Report of the Federation of Lancashire and Cheshire Museums and Art Galleries* that the question of affiliation with the Museums Association was discussed, but this Federation declined to become affiliated.

*The Journal of the Ministry of Agriculture* (Vol. XLI, April) contains an account of the potato growing conference at Rothamsted, and also an article by F. Hanley on ' Experiments on the Germination of Decorticated Sugar-beet Seed.'

A paper of interest to our readers appears in *The Proceedings of the Leeds Philosophical and Literary Society* for January, just issued. It is entitled ' Carbon Assimilation by *Chlorella* in Windermere,' by L. Loose, W. H. Pearsall, and F. M. Willis.

Dr. H. O. Bull gives a valuable and extensive classified index to the literature of the Cullercoats Marine Fauna and Flora in the *Report of the Armstrong College Dove Marine Laboratory*, just published. In addition, there are papers on Herring Investigations ; Larva of *Calocaris macandrae* Bell ; and Note on the Fauna of the Northumberland Coast Salt Marshes.

*The British Mycological Society Transactions*, Vol. XVIII, Part 3, 1933. The papers printed in this issue are mainly of phyto-pathological interest, and include ' A New Species of *Hendersonula* (*H. toruloides*) on Deciduous Trees in Egypt,' by R. M. Nattrass ; ' *Azygozygum chlamydosporum* nov. gen. et. sp. : a Phycomycete associated with a disease condition of *Antirrhinum majus*,' by Chas. G. C. Chesters ; ' Studies in the Morphology and Biology of *Helminthosporium Avenæ*,' by R. W. G. Dennis. A paper of interest to field mycologists is by J. Ramsbottom on ' *Tremella mycetophila* Peck,' which, according to the author, represents a teratological condition affecting the pileus and stipe of the common agaric, *Collybia dryophila*. ' New Chytridiaceous Fungi,' by F. K. Sparrow, is a valuable contribution to our knowledge of species parasitic on fresh-water algæ.—F.A.M.

*The Entomologists' Monthly Magazine* for February contains ' More Notes on Cornish Diptera ' (concluded), by Rev. A. Thornley (*Hebecnmae mallochi* Collin, and *Pycnoglossa signata* Briscuké are new to Britain) ; ' A New Species of *Cathormiocerus* from Britain (Col.),' by K. G. Blair (*Cathormiocerus britannicus* Blair from the Lizard and Tintagel, Cornwall, allied to *C. myrmecophilus* Seidl.) ; ' The Aquatic Coleoptera of North and South Kerry,' by F. Balfour-Browne (an important paper, incidentally noting *Hydroporus rufifrons* from Askham Bog and Chaloner's Whin, York) ; ' Notes on Wasps : I. Attempts to domesticate a queen of *Vespa rufa* Linn,' by G. E. J. Nixon ; ' The Male *Lecanium corni* Bouché,' by C. T. Gimingham ; ' Observations on *Odynuus* (*Lionotus*) *herrichi* Sauss. in Dorset,' by G. M. Spooner ; and several short notes. There is also a report of the annual meeting of the Entomological and Plant Gall Sections of the Yorkshire Naturalists' Union by W. D. Hincks.

*The Entomologists' Record* for February contains 'Lepidoptera at Maurin, Basses-Alpes, France,' by W. P. Curtis ; ' The Geometers of Storrington, W. Sussex,' by G. S. Robertson ; ' Cornish Notes, 1933,' by C. Nicholson ; ' Collecting Butterflies in Orissa, India,' by W. M. Crawford ; ' Nomenclature,' by H. J. Turner ; Notes on Collecting, Current Notes, and Supplements ; ' British Noctuae,' by H. J. Turner ; and ' Butterflies of the Upper Rhone Valley,' by R. Verity. In ' Cornish Notes ' Mr. Nicholson records that out of twenty-nine specimens of the rare immigrant butterfly *Danaus plexippus* taken or seen in these islands in 1933 seven occurred in Cornwall. This species occurs usually at or near coast towns, and he suggests the probability of their having been brought over from America by trading or other vessels. There is no doubt that 1933 was a ' clouded yellow year ' in the S.W. of England, *Colias crocens* was everywhere, though not in phenomenal numbers.

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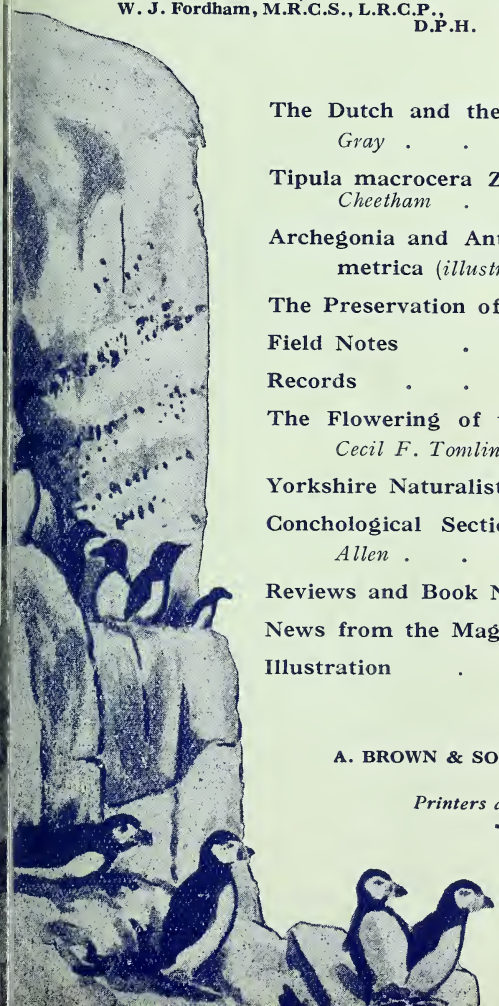

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# THE DUTCH AND THE GREENLAND SEA.

ROBERT W. GRAY.

Dutch whalers frequented the Greenland Sea for some two hundred years (from 1611 to about 1800). In the course of this long period they made a number of geographical discoveries which I wish to recall, but before doing so, it seems advisable to refer at some length to the ice, and to the right-whale fishing in the prosecution of which the Dutch played such a very important part.

## 1. The Ice.

The 'Greenland'[1] or in modern language the Spitsbergen Sea—the scene of the right-whale fishery, is the chief outlet of the Arctic Ocean and a strait or channel, through which owing to the direction of the current and prevailing wind, an immense amount of ice drifts south. This ice, which is mostly very thick and the product of more than a single winter's frost, is at first in the form of extensive sheets, termed by the whalers 'fields' and 'floes,' is sooner or later converted by the swell of the ocean into broken ice or 'pack.' Finally as it continues to drift south it melts and disappears.

As the charts issued annually by the Danish Meteorological Institute show, the Arctic ice is subject to considerable fluctuations:[2] very open seasons, in which its edge is farther north than usual, and those of an opposite character occurring from time to time.

These fluctuations appear to depend on the activity of the oceanic circulation: more warm water entering and more cold water leaving the Arctic Ocean, in very open than in very close seasons. Evidence of this is to be found in the temperature of the water and in the rate at which the ice is drifting south. In very open seasons the temperature of the water near the coast of Spitsbergen may be as high as 45°, whereas in the same situation in close seasons the winter ice persists far into the summer months. Again in very open seasons the ice may be drifting south at the rate of 30 miles a day, whereas in close seasons it may be stationary or drifting only very slowly south.[3]

On their outward voyages the whaling vessels (keeping in about long 5° E.) had usually no difficulty in reaching the 'heavy' or polar ice, in the outskirts of which the Greenland Whales were usually caught. Sometimes, however, in what

[1] 'Greenland' an old name for Spitsbergen; hence the many terms 'Greenland sea, Greenland whale, etc.'

[2] *The State of the Ice of the Arctic Seas*, 1899-1933; issued annually by the Danish Meteorological Institute.

[3] See my 'Peterhead Whalers'; *Scottish Naturalist* (seasons 1874 and 1881).

Scoresby calls 'close seasons' they found their northward progress barred by a barrier of ice, sometimes termed a 'South-east pack' situated in lat. 76°. Once through this obstacle, a difficult and perhaps impossible piece of navigation for a sailing ship, the whalers found themselves in an open pace or 'water' extending as far as the edge of the heavy ice. Usually the whalers came to the latter in about lat. 80° but sometimes they found it farther north, making it possible to round Hakluyt's Headland and (if they so desired) sail perhaps as far east as North-east Land.[1]

## 2. The Right-Whale Fishing.

The Spitsbergen waters appear to have formed a favourite resort of the right-whales during part of the year. To have seen them in their thousands, as yet undisturbed, sporting about and feeding on the minute creatures with which these waters abound must have been an interesting sight.

All the right-whales killed at the Spitsbergen Fishery are usually assumed to have been Greenland whales; but this is perhaps a mistake. The whales killed presumably in the summer months and in the open seasons in the inlets of West and North Spitsbergen and in the open water between the land and the ice may have been Atlantic whales, not Greenland whales. In open seasons *Balaenoptera musculus* (the Blue whale) frequents the open water West of Spitsbergen in the spring and summer and Atlantic whales, when still numerous, may well have done the same.[2]

The Dutch whalers attacked the Greenland whales in the spring off the west coast of Spitsbergen before they disappeared into the depths of the 'heavy' or polar ice, and again in the autumn when they reappeared off the north and east coasts of the archipelago. Each of these 'fishings' requires a separate notice.

## 3. The 'Spring Fishing.'

Referring to this 'fishing' Scoresby says:[3] '(in the outskirts of the ice) the parallel of 78 to 78½ degrees is on the whole the most productive fishing station. The interval between this parallel and lat. 80° or any other more remote, is called the "northward" and any station in a lower latitude is called the "southward."'

'Though' Scoresby says 'The 79th degree affords them perhaps in the greatest abundance, yet the 76th degree affords them perhaps more generally. In this latter situation a very

[1] Nordenskiold's *Arctic Voyages* p. 66.
[2] cf Scoresby: *Arctic Regions*, Vol. I, p. 482.
[3] Scoresby: *Arctic Regions*, Vol. II, p. 212.

large kind of mysticetus is commonly to be found throughout the (spring) season from April to July inclusive. Their number is however not often great ; and as the situation in which they occur is unsheltered, and consequently exposed to a heavy swell the southern fishing is not much frequented.'

In ' close seasons ' the whaling ships had to choose between persevering to the northward through the barrier or ' S.E. pack ' and remaining behind and prosecuting the fishing in lat. 76° exposed to the swell. Ships successful at this ' southern fishing ' were sometimes home again in June.

Incidentally the ' spring fishing ' was continued down to a quite recent date, but after about 1820 in only a very small way. The Dutch were the pioneers and this fishing seems to be the first instance in which whales were caught in deep water far from land where a great length of line has to be used and the whales ' flensed ' or flayed in the water alongside.

The spring fishing over, the Dutch whalers either cruised in the outskirts of the ice in the hope of picking up an odd whale or they resorted to Mauritius Bay[1] or to one of the many snug havens in which northern Spitsbergen abounds. They resorted to these situations for a double purpose ; to await the return of the whales and the time for re-commencing the fishing and to ' make off '[2] (*i.e.* chop up and stow away the blubber of the whales already captured). This troublesome operation over, some of the more successful ships may have sailed for home.

## 4. The ' Autumn Fishings.'

Very little seems to have been written about these fishings and a belief in their occurrence is largely based on the following evidence.

(*a*) The bones of right-whales. The whales to which these bones belonged may have been flensed on the spot or they may have been flensed at sea, their carcasses subsequently floating up and drifting ashore.

(*b*) Graves, some with Dutch inscriptions and doubtless those of whalers who probably succumbed to their enemy scurvy.

(*c*) Traces of ' cookeries,' ' try-works,' or oil-boiling places reminiscent of the early days when the whalers prosecuted the fishing from the shore or from ships anchored near it boiling their blubber on the spot instead of taking it home in the raw state.

(*d*) The many anchorages (one as far east as Great Island)

[1] In 1773 Phipp's saw Dutch whalers anchored in Mauritius Bay. Phipp's : *Voyage to the Greenland sea in* 1773.

[2] ' Making off ' ; believed to be from the Dutch ' afmaaken ' to complete.

indicated on old Dutch charts of Spitsbergen where the whaling ships anchored and sent their boats out to look for whales.

As already stated the autumn fishing was prosecuted in two situations: off the north and off the east coast of the archipelago. Each requires a separate notice.

### 5. The 'Fishing off the North Coast.'

Concerning this fishing Scoresby says:[1] 'When the fishery for the season, in the opinion of the British whalers, has altogether ceased, it appears from the observations of the Dutch that it may frequently be recommenced in the autumn at the verge of the most northern waters near Hakluyt's Headland . . . in consequence of the dangers attending the northern fishery in the spring, the Dutch appear to have preferred the fishery of high northern latitudes in the autumn, as a considerable degree of success may reasonably be expected from it, without the same risk of getting their ships beset as they are exposed to in the spring. The many calamities which have occurred to the Hollanders, from their ships getting beset, occasioned an excess of dread of the ice in high latitudes (in the spring).

Such of their ships as happened to get enclosed in the ice under unfavourable circumstances, not only failed altogether in the fishery but not infrequently accompanied the ice in its drift by the course of the south-westerly current, and remained beset until the approach of winter. In some instances they were obliged to winter in the Polar Regions, and on several occasions, their ships were wrecked, and many, if not all, of their crews perished under the most afflicting circumstances.'

Parry referring to whalers' graves and the bones of right-whales says: 'The neighbourhood of this bay (Trurenberg) like most of the northern shores of Spitsbergen appears to have been much resorted to by the Dutch at a very early period, of which circumstance records were furnished, in almost every spot where we landed by the numerous graves which are met with. There are thirty on the point of land on the north side of the bay . . . several were 50-60 years old and one bore the date 1738.'

Again Parry says: 'Lt. Foster (who explored Hinlopen Strait) saw some seahorses (walrus) narwhals and white whales but no black whales, nor did we in the whole course of the voyage see any except, on the ground frequented by our whalers, on the western side of Spitsbergen. It is remarkable however that the "crown bones" and other parts of the

[1] Scoresby: *Arctic Regions*, Vol. II, p. 215.

skeletons of whales are found on most parts where we landed on this (northern) coast.'

The preference of the Dutch for this fishing can be easily understood : it was prosecuted in sheltered situations and at a season when the weather is often fine. On the other hand it seems to have had one serious drawback : ships prosecuting it were liable to have their retreat cut off by the ice. In 1683 according to Conway,[1] thirteen Dutch ships had to be abandoned in Trurenberg Bay from this cause.[2] No doubt the Dutch whalers kept a watchful eye on the ice, and when, owing to northerly winds it threatened to drift south and cut off their retreat, they were not slow in getting underweigh and escaping west round Hakluyt's Headland or perhaps south through Hinlopen Strait.

An account of the autumn fishing by an eye witness might prove interesting reading, unfortunately no such account appears to exist. The fishing seems to have been prosecuted as far east as the Seven Islands, on the shore of which the bones of Greenland whales were observed by Nordenskiold in 1861.[3] Was the fishing prosecuted at the verge of the most northern waters (*i.e.* at the ice-edge) as Scoresby says : or did it resemble the ' fall fishing ' or ' rocknosing ' of the ' West Side ' of Davis Strait, where the whaling ships lay at anchor in snug coves and sent their boats out in the day-time to intercept the migrating whales ?[4] If the former, in very open seasons the Dutch whalers may have been sometimes as far north as lat. 82° and even lat. 83°. In any case in the end of September or beginning of October (perhaps earlier) when the surface of the sea begins to freeze the Dutch whalers must have felt obliged to give up the fishing and sail for home. How long they tarried one cannot say.

This fishing seems to have been at its height about the year 1700, but when it commenced and ended is very obscure. In 1690 according to Zordrager[5] traces of oil-boiling places reminiscent of the early days were still to be seen at many places on the north coast. Parry[6] found a tomb with a Dutch inscription dated 1690, and in 1861 the Swedes found another dated 1730.[7] In 1773 according to Phipps[8] the Dutch ships still remained out in the hope of being able to prosecute this fishing. 1773 seems to have been an unfavourable season.

1 Conway's *No Man's Land*, p. 217.
2 In similar circumstances thirty-four American whalers were abandoned off Cape Belcher, Alaska, in 1871.
3 Nordenskiold's : *Arctic Voyages*, I, cp. 79.
4 Barron : *Old Whaling Days*, p. 15.
5 Wieder : *Discovery and Mapping of Spitsbergen*, p. 40.
6 Parry : *Narrative of an Attempt to reach the North Pole.*
7 Nordenskiold's : *Arctic Voyages*, p. 59.
8 Phipp's : *Voyage to the Greenland sea in* 1773.

The last Dutch ship sailed from Mauritius Bay on August 17th either for home or to try her luck off the south-east coast.

6. East of Spitsbergen.

Referring to this fishing Scoresby says:[1] 'In the seventeenth century some adventurous persons sailed to the east of Spitsbergen, where the current has a tendency it is believed, to turn the ice against the shore, yet, here finding the sea open, they attempted to prosecute the fishery, and it seems with some success a great whale-fishery having been made off Stans Foreland in 1700.'

Speaking of this fishing Zordrager says:[2] 'At this time of the Greenland Company there was an important fishery below the south ice, east of Spitsbergen, and in the Disco. . . . This I have been told . . . by my pilot, Tennis Battisz, who was with me in the year 1693, then an old man. His father William, had served the Noordische Company as commander. This man told me with much detail how the company's ships, shortly before and also during his time, used to ride at anchor at Disco and below Half-moon Island, and send out their whale-boats provisioned with all things necessary for several days to fish east of Spitsbergen along a great ice-berg (King John's glacier) and thus though with much toil with sailing and rowing, (killed and) towed many fish (*i.e.* whales) to the ships that lay in the bays. . . . If the ice came driven along by a north-east wind, they raised anchor and fled before it with the ships out to sea.'

Again the history of this fishing is very obscure. Wieder in his *Discovery and Mapping of Spitsbergen*, says: 'There are several indications that the whale-fishery, during the lifetime of the Noordische Company was practised by the Dutch in the eastern part of the archipelago. In 1622 the Dutch eastern fishery is already spoken of . . . Disco Bay and Half-moon Island, both names of Dutch origin, are quoted during this period, and in some later time. Zordrager found remains of Dutch cookeries (or oil-boiling places) on the south coast of Edge Island, on the shores of Wybe Jans Water, and in Hope Island, and Halvemaan's Island.'

7. Certain Dutch Discoveries.

The Dutch whalers were most probably mainly interested in catching whales and in getting back to Holland as soon as possible with profitable voyages. Risking their ships in the hope of seeing remote and valueless lands was most probably

[1] Scoresby: *Arctic Regions*, Vol. II, p. 180. In 1817 Scoresby Sen., at the conclusion of the spring, fishing went to look for whales off Stans Foreland but was prevented by ice.

[2] Quoted from Conway's: *No Man's Land*, p. 129.

not their practice. Any discoveries they may have made only help to prove that very open seasons occur from time to time in which they were obliged to look for whales farther away from Spitsbergen than usual.

The discoveries I refer to do not concern Spitsbergen but lands much more remote and inaccessible, the vicinity of which the Dutch whaling ships could only reach in very exceptional circumstances. They are Lambert Land[1] and Edam Land[2] towards the west, and Gillis Land towards the east. The identity of the two former with the east coast of Greenland, is not a matter of doubt but that of Gillis Land discovered by Gillis a Dutch whaling captain in 1707, is still the subject of dispute. These discoveries were made at a time when the Arctic seas were to a large extent still unexplored and when little interest was taken in Arctic exploration for its own sake. They were also taken at a time when ships, particularly whaling ships, were often very uncertain of their position and consequently of any hitherto unknown land seen by them in the distance.

Gillis's log-book has unfortunately not been preserved, but this deficiency is to some extent made good by a letter from John Wallig, a retired whaling captain living at the Helder, dated 1773. In this letter, which is a reply to an enquiry concerning the latitudes attained by the Dutch whalers, Wallig says: 'But in the year 1707, Captain Cornelis Gillis, having gone without (seeing) any ice far to the northward of 81°, sailed to the north of the Seven Islands, proceeded from thence east, and afterwards south-east, remaining to the east of the north-east land, when, coming again to latitude 80°, he discovered about 25 Dutch miles (15 to a degree at the equator) east from the country to the north-east very high lands, on which so far as we know, nobody has ever been.'

Perhaps Gillis followed the edge of the ice a very usual practice with the whalers when looking for whales and one which in an unusually open season might easily lead a ship to the vicinity of Franz Joseph Land.

Apart from information contained in Barrington's *North Pole* and my paper 'The Andree Dairies' published in *The Naturalist* two years ago, the following fact shows that seasons do occur from time to time in which this can be done.

(*a*) In 1837, according to Dr. H. Whitworth, the *True Love* of Hull was in lat. 82½° long. 12° E., and had in sight towards the north-east an ice-free sea.[3]

(*b*) In 1848, according to Captain Willis, the *Sarah Elizabeth*, of Hull, was in lat. 82° N., long. 15° E., in

[1] Lambert Land in lat. 79°, discovered in 1670.
[2] Edam Land in lat. 78°, discovered in 1655.
[3] Atheneum Decr., 1853.

the beginning of May with ice in sight towards the north and west but towards the east, as far as could be seen, only open ice-free sea.[1]

(*c*) In 1827, according to Parry 'a ship might have sailed as far as lat. 82° almost without touching a piece of ice and it was the general opinion among us that by the end of the month (August) it would probably have been no very difficult matter to reach the parallel of 83° about the meridian of the Seven Islands.'[2]

(*d*) In 1922, 1930, and 1931, according to information collected by the Danish Meteorological Institute, the sea north of Spitsbergen was unusually open with much open water eastwards towards Franz Joseph Land. In any of these seasons in July or August and probably in September, a ship without entering the ice might have sailed as far north as lat. 81° or 82° and as far east as 30° or 35° E.

The following are a number of reasons why 'Gillis Land' ought to be identified not with White Island as on modern maps but with Franz Joseph Land.

(1) Wallig's statements in his letter quoted above seem much more applicable to Franz Joseph Land than to White Island.

(2) In a very open season which 1707 appears to have been, the edge of the ice would be far north, and a whaling ship sailing east along its edge would come to Franz Joseph Land not to White Island.

(3) The identification of 'Gillis Land' with White Island implies, firstly, that in 1707 Gillis discovered not 'lands' some distance away from Spitsbergen but only a small island quite near; secondly, that in 1707 the Dutch whalers were still unaware of the existence of White Island. Although the old Dutch maps appear to say so, this is difficult to believe. As early as 1614, according to Wieder,[3] the entire circumference of Spitsbergen was known to the Dutch whalers and, according to a Dutch chart published by him,[4] the circumference of North-East Land was known to them in 1682. Are we to suppose that the Dutch knowledge of North-East Land and the islands east of it did not increase between 1682 and the year 1707? The fishing was at its height; the Dutch whaling fleet numbered 150 ships[5]; they prosecuted the

[1] Petermann, Dr. A.: *Geography and Exploration of the Polar Regions*, Mittheilungen 18 Band 1872, p. 110.

[2] Parry: *Narrative of an Attempt to reach the North Pole*, p. 148.

[3] Wieder, Dr. F. C.: *Discovery and Mapping of Spitsbergen*, p. 2.

[4] Wieder, I cp., plate 27.

[5] According to Scoresby, *Arctic Regions*, Vol. II, p. 156, in the ten years 1699-1708, the Dutch sent to 'Greenland,' *i.e.* Spitsbergen, 1,652 ships, which returned with 301,250 casks of blubber and 13,544,000 lbs. of whale-bone, the produce of 8,537 whales.

fishing off the north and east coasts in the autumn, when there is often very little ice ; lastly, as Zordrager says, and the old maps show they knew of many anchorages where they could anchor their ships and go away in their boats looking for whales and incidentally adding to their knowledge of the 'country.'

(4) White Island is only 30 miles east of Great Island. It is 800 feet high, and in clear weather (apart from refraction) ought to be visible from a ship's masthead at least 40 miles away and as it is glaciated in favourable circumstances its 'blink' or reflection ought to indicate its presence 100 miles away.

(5) Many old maps show 'Gillis Land' in the position of White Island, but as the late Dr. Petermann[1] pointed out always in the form of a cape and part of an extensive country farther east, and as we now know in the position of Franz Joseph Land. In the same way in 1864, Nordenskiold[2] mistook the Wyche Islands for a cape and part of an extensive country farther east.

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## *TIPULA MACROCERA* ZETT. IN YORKSHIRE.

CHRIS. A. CHEETHAM.

This species was first introduced to the British list in 1926, when Dr. F. W. Edwards found specimens in collections from the Black Mountains and from Haugh Wood, Herefordshire. Other odd specimens have been found since these in Cheshire and Devon, and last year Dr. Edwards found it very plentiful in Scotland on mountains about 3,000 feet in altitude. Whilst taking lunch on Ingleborough on May 27th last he pointed out a female ovipositing which he considered to be this species, and we made a short search but saw no more, though the cotton-grass species *T. subnodicornis* Zett. (*plumbea* Walk.) was very plentiful ; the females of this species have short wings and so are easily known. On the 29th I walked up from Cold Cotes and saw the cotton-grass species with its leaden-coloured body in thousands, but excepting an odd specimen of *T. alpium* Bergr. I could find nothing else. On arriving at the lunch spot at the head of Mere Ghyll Sike, I was glad to find an odd male *macrocera* amongst the plentiful *subnodicornis*, and later I found that *macrocera* occurred in plenty further down on the steep, wet, shaley hillside. It is evidently one of the earliest of the mountain species with us and in Scotland, and in this it agrees with the dates, April and May, of the more southern captures.

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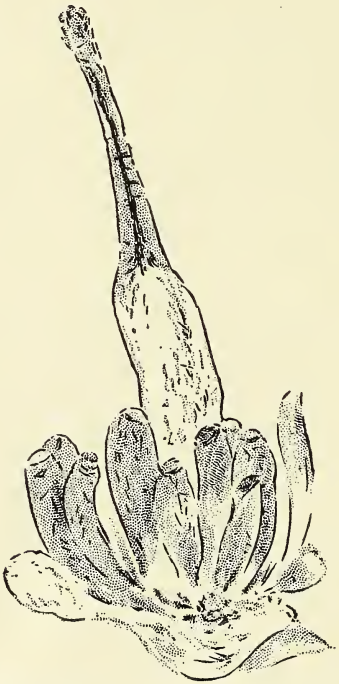
[1] Petermann, Dr. A.: l.c. 111.
[2] Nordenskiold's : *Arctic Voyages*, p. 123.

## ARCHEGONIA AND ANTHERIDIA IN *FUNARIA HYGROMETRICA.*

E. HALLOWELL.

In the older editions of Campbell's *Mosses and Ferns* the statement occurs that *Funaria hygrometrica* is strictly dioicous. In a later edition, however, it is stated, on the authority of



**Male Flower of *Funaria Hygrometrica* with an *Archegonium*.**
(Showing Synoicous condition).

Boodle, that it is monoicous, the archegonia being situated on a branch.

I have examined a large number of plants and have found various conditions regarding the reproductive organs ; the most striking was a synoicous one, in which a single archegonium held a lateral position on a male flower.

I found two plants of this kind on the same day. I lost one of them but managed to mount the other in glycerine jelly. I made a drawing of this one which I sent to Mr. W. H. Burrell, who suggested this note.

## THE PRESERVATION OF WILD PLANTS.

Every field botanist can cite examples of wild plants which, in a given locality, have either disappeared or enormously decreased in quantity in recent years. Most naturalists are aware that, near urban areas, even our commonest wild flowers show the effects of continued gathering. The development of motor transport and of roads, makes it certain that these effects are likely to increase rather than decrease. The possible remedies for this condition are three in number. The gathering or injury of wild plants may be prohibited by law. Secondly, public opinion may be educated to a pitch at which damage to wild plants becomes a social offence ; or, thirdly, we may simply institute nature reserves or national parks in which the representative species are maintained.

Of these three methods, experience, especially in the United States of America, has proved that the second is probably the most efficacious and, as a result, the Wild Plant Conservation Board of the Council for the Preservation of Rural England has recently issued a pamphlet in which more active steps in this direction are urged, especially on the part of teachers and of Natural History Societies. At the same time, in response to the request of a majority of County Councils in England and Wales they have issued a most useful schedule of wild plants which ought to receive protection in each county. The lists given are the work of experts, and to avoid becoming unwieldy, they omit certain rare and inconspicuous species which would only attract the attention of botanists. In preparing these lists, the Board had in mind the discretionary enforcement of the County bye-laws for the protection of wild plants. They suggest that it would be useful for magistrates and police officers to have available a list of species which are in danger of extinction, and also, that the list might usefully be issued to teachers and to the press to draw renewed attention to the fact that protective by-laws exist.

In regard to the third method of protection, that of instituting nature reserves, it is a matter of common knowledge that the National Trust already prohibits gathering or injury to plants on its public properties. A further method of maintaining the native flora is that adopted at the Hawksmoor Nature Reserve, where the North Staffordshire Field Club proposes to introduce all species of Staffordshire plants which grow naturally under the conditions found at Hawksmoor. Similar measures are proposed at the Bonar Law College at Ashridge. Such steps seem particularly suitable for application to the semi-natural parks which are springing up near large towns and, in addition, it may be urged that every bird sanctuary should also be a plant sanctuary.

*1934 July 1*

We draw the attention of our readers to these measures, with every confidence that they will keep their object and the work of the Wild Plant Conservation Board in mind.

## FIELD NOTES.

**Finnish-bred Black-headed Gull in the West Riding.**—On February 26th the head gamekeeper at Harewood Park, near Leeds (Mr. T. Williams), saw a seagull with a damaged wing. He caught and killed it, as an act of mercy, when he noticed that it had a metal ring on one leg. It was marked 'Mus. Zool. Helsingfors,' with a number. This he communicated to me (through Mr. Fearnley), and I went over to see it, and found it to be a Black-headed Gull in its first winter plumage. I sent this information to the Museum Zoologicum Universitatis, Helsingfors, and received the following reply:—'I beg to express to you my very best thanks for the notice about the marked Finnish Gull with the ring C.16197. The bird in question was marked at Vik on the 4th June, 1933, by Student O. Hytönen. Vik is a big shallow bay near Helsingfors with brackish water, where this species breeds in thousands. Please present the gamekeeper our thanks for the information. Yours faithfully, S. Välikangas.' Although this is not actually the first bird to reach Yorkshire from this gullery,[1] to the best of my knowledge it is the first to have penetrated into the West Riding.—H. B. Booth, Ben Rhydding.

**Ash Trees.**—The abundance of the flowers on the Ash trees at present is attracting attention from people one scarcely looks on as Naturalists, and notes on the matter have appeared in the daily press. The exceptionally early crop of mushrooms has acted in the same manner and these have been remarked on in widely separated localities. We might reasonably expect a good crop of Ash keys this year as a result of the almost complete absence of them last year, but last year's drought may also have helped, and this is probably the cause of the early mushroom harvest. Another probable result of the dry preceding year is the wonderful show of blossom on the Blackthorn.—Chris. A. Cheetham.

**Late Emergence of Stone-flies in North Derbyshire.**—The early species of Stone-flies have been later in emerging this season than for some years past, according to my experience in North Derbyshire. From the stream flowing through Padley Woods the following were first seen on March 29th, and in very small numbers: *Capnia vidua* Klap. (1933 on March 11th, 1932 on February 27th, 1931 on March 21st);

[1] See *British Birds*, Vol. XXV, p. 252.

*Protonemura meyeri* Pict. (1933 on February 11th, 1932 on February 6th) ; and *Leuctra hippopus* Kny. (1933 on March 11th, 1932 on February 6th). *Protonemura praecox* Mort. appeared on April 7th (1933 on April 1st, 1932 on March 30th), but curiously, *Nemurella inconspicua* Pict., a species usually not appearing with us until June, was found emerging on April 7th (a single specimen only).—James M. Brown, Sheffield.

**Tetraphis pellucida.**—This very common moss is so rarely found fruiting in the West Riding that its occurrence is worth recording. Many immature capsules were seen by Cheetham and Burrell on April 24th at Plompton, about five miles from Wetherby, where the fruiting plant was seen many years ago by Wesley.—W.H.B.

**Lesteva fontinalis Kies. in Yorkshire.**—Some time ago I had occasion to submit some specimens of *Lesteva* to my friend, Prof. Sir T. Hudson Beare, for examination. Among them he detected an example of *L. fontinalis* Kies., in which I was much interested. The insect was taken in wet moss near the waterfall in Whitfield Gill, Askrigg, so long ago as June, 1914. This species was introduced as British by the late E. A. Newbery in 1910 (vide *Ent. Mon. Mag.*, 1910, p. 109), and occurs in some localities in the south of England. But the beetle is not recorded from further north than Cannock Chase, and Upper Dodder, Co. Dublin.—M. L. Thompson, F.R.E.S., Middlesbrough.

**Cumberland Parasitic Hymenoptera.**—As we yet know so little of the distribution of these insects in Britain, the following records may be interesting, particularly as many have been determined by Mr. C. Morley. Cynipidae.—*Cynips kollari* Htg., common on Oaks. *Rhodites rosae* Linn., bred at Kelsick, 22.5.26 ; also several times in the Carlisle district. *Spilothrix radicis* Fab., Orton, 11.8.22. *Dryophanta folii* Linn., Todhills, 15.10.28, a ♀. *Melanips urticeti* Dahlb., Todhills, 4.10.29. Proctotrypidae.—*Exallonyx niger* Hal., Todhills, 15.10.28. *Trichopria ciliaris* Kieff., Todhills, 19.8.32, a common species. *Diaphria conica* Latr., Orton, 22.3.22, a ♀. *Platygaster sonchis* Walk., Orton and near Longtown. *Conostigmus allotropus* Kieff., Gelt Woods, 21.8.15, a ♀ ; Kelsick, 22.5.24. *C. halteratus* Boh., Orton, 16.9.16. *Lagynodes pallidus* Boh., Longtown, 17.5.27, one specimen, but probably common, as I have frequently taken it in Dumfriesshire by sweeping and in moss. *Ceraphron nigraticeps* Kieff., Gelt Woods, 21.8.15. Chalcididae.—*Callimone regius* Nees, Orton, 24.6.21, bred from galls of *Cynips kollari* Htg. *Trigonoderus princeps* Westwood, one swept in a lane at Kelsick near Wigton, 19.8.25.—Jas. Murray, Gretna.

## RECORDS.

### THE RUSTS OF NORTH AMERICA.

Mr. J. C. Arthur, of Purdue University, Indiana, U.S.A., the leading American mycologist, is shortly bringing out a Manual of the Rusts of North America. It is expected to appear early this summer. In it he has put forward a somewhat novel classification, founded upon the International Rules of Nomenclature, and conforming more closely than has hitherto been the American practice, to the nomenclature customary in Europe. He also gives in great detail the distribution of the various species, and illustrates them by numerous figures. This work will merit the attention of every mycologist, since the author bases his classification upon fundamental facts.—W. B. Grove.

### THE DIVING POWERS OF WATER HENS.

Although, as Mr. Stuart Smith says (*The Naturalist*, 1934, April, p. 78), the water hen is not an accomplished diver, it develops this ability at a very early age.

While fishing on the River Derwent in Forge Valley on June 7th, 1929, I came across a water hen's nest in a low bush at the water's edge. It contained eggs just chipping and four very newly hatched young ones. As soon as they saw me the tiny birds, probably less than an hour out of the shell, scrambled over the edge of the nest and dropped in the water. Here they immediately dived beneath the surface and all the four of them made their way straight across the stream to the shelter of the opposite bank, approximately ten yards away, without once rising to the surface. They appeared very buoyant and had difficulty in keeping beneath the surface, and as the water was very clear I was able to see distinctly that both wings and legs were used to propel themselves.—W. J. Clarke.

## THE FLOWERING OF THE HORSE-CHESTNUT TREE

CECIL F. TOMLINSON.
(*Rector of Bolton Abbey*).

The following particulars about a tree grown from a horse-chestnut may be of interest, and it would be interesting to know whether they correspond with similar observations made by others. In the autumn of 1914 I planted in my garden at Ripon a chestnut seedling, that had sprung from a chestnut in the spring of that year. In February, 1917, I moved to Bolton Abbey and transplanted the little tree in the Rectory garden there ; about ten years ago, as it promised to be a shapely tree, I had it replanted, with the Duke of Devonshire's permission, in the park at Bolton Abbey, where it may now be seen on the left-hand side of the path leading from the ' hole in the wall ' to the stepping-stones. This year the tree flowered for the first time in its existence ; it is twenty years old, about twenty feet high, and has never been pruned ; there were fifteen fine pyramids of blossom of the white variety. It would be interesting to know whether twenty years is the average age of a horse-chestnut tree when it first produces blossom.

## YORKSHIRE NATURALISTS AT SEMERWATER.

The Whitsuntide meeting was arranged with a view to a survey of the little-known Semerdale area. There was a good muster of members and things seemed promising, but the weather proved unfortunate and the previous week's rain had so filled the lake and streams that the fresh-water biologists in the words of one of them, ' were not able to get to the streams for water.' Fortunately, later in the week, the weather improved and the few who stayed on were able to accomplish work which was impossible during the week-end meeting.

The Invertebrate Fauna of the River Bain and of Semerwater (J. M. Brown).—The flooding experienced at the week-end had somewhat subsided by the middle of the following week, and it became just possible, but with difficulty, to reach the main bed of the river and lake, so that representative gatherings could not be made. Few living organisms could be obtained from Semerwater by marginal netting. Nymphs of *Siphlonurus lacustris* were plentiful and this was the only Ephemeropteron seen. A single case-building Caddis, *Limnophilus* sp., a peculiar spinous Tipulid larva and several Chironomids were obtained. Enormous numbers of immature specimens of the Hemipteron, *Micronecta minutissima* gave the water at the edges the appearance of being crowded with fresh-water fleas. A few specimens of the brightly-coloured beetle, *Prasocuris phellandrii* were swept from the marginal plants. A single individual of the Pond-mussel, *Anodonta cygnea*, was found stranded, and several *Limnea truncatula* and small *Planorbis* were taken.

The River Bain yielded more species, but again Caddis larvæ were scarce. The tube-building forms were represented by *Halesus digitatus*, the web-forming types by *Plectrocnemia* and *Polycentropus*. *Agapetus* was not seen, though plentiful in the side becks. May-fly nymphs were much more numerous both in individuals and species. *Paraleptophlebia submarginata* and *Ecdyonurus longicauda* appeared to be the most plentiful, but *Habrophlebia fusca*, *Heptagenia sulphurea*, *Rithrogena semicolorata*, *Ecdyonurus venosus*, and *Bætis* sp. also occurred. Stone-fly nymphs included *Chloroperla grammatica*, *Isopteryx torrentium*, *Protonemura*, *Amphinemura*, *Nemoura*, and *Leuctra*. Hemiptera were present, *Acanthia saltatoria* on the marginal stones, *Velia currens* on the water surface in backwaters, and again, as in the lake, very large numbers of immature *Micronecta minutissima*.

Among the Crustacea the Crayfish and *Gammarus* were taken. Some of these latter were found to be parasitised by the interesting Acanthocephalous, ' worm ' *Polymorphus minuta*, also found last August near Ripon.

No Planarians were seen in the river, but in some of the tributary becks they were plentiful, *Planaria polychroa*, *P. alpina*, and *Polycelis nigra* being seen. In these becks *Rithrogena semicolorata* was the most noticeable May-fly nymph, and the large *Perla cephalotes* also occurred, though not noted in the river. During the week-end Mr. Allen obtained a single nymph of *Ephemera danica* and a specimen of *Anodonta cygnea* in a muddy reach of the river.

Conchological Report.—Mrs. E. M. Morehouse writes: Through the kindness of the members of the Y.N.U. collecting various snails and slugs, which were forwarded to me, the following list comprises the species found during the Whitsuntide Meeting. On Saturday, the right side of the river was visited; Sunday, Whitfield Gill, and Monday, the left side of Semerwater. To save repetition the species were found in each locality except where name appears otherwise.

*Arion ater* Linné.
*A. ater* v. *marginella* Schranck, s.v. *griseo-marginata*. R. Semerwater.
*A. ater* v. *brunnea*. Whitfield Gill.
*A. subfuscus* Drap.
*A. conscriptus* Johnson.

*A. conscriptus* s.v. *grisea*. L. Semerwater.
*A. intermedius* Normand. Whitfield Gill.
*Limax maximus* Linné.
*L. arborum* Bouchard-Chantereux. Whitfield Gill.
*Agriolimax lævis* Müller. R. and L. Semerwater.
*A. agrestis* Linné. R. and L. Semerwater.
*A. agrestis* v. *nigra* Morelet. R. Semerwater.
*A. agrestis* v. *brunnea* Taylor. R. Semerwater.
*Helix hortensis* v. *lutea* Moquin-Tasdon. R. Semerwater and Whitfield Gill.
*H. hortensis* v. *quinquevittata* Moquin. R. Semerwater and Whitfield Gill.
*Vitrea alliaria* Miller. R. Semerwater.
*V. rogersei* B. B. Woodward. R. Semerwater.
*V. nitidula* Drap. R. Semerwater.
*V. pura* Alder. R. and L. Semerwater.
*Zonitoides nitidus* Müller. L. Semerwater.
*Euconulus fulvus* Müller. R. Semerwater and Whitfield Gill.
*Punctum pygmæum* Drap. Whitfield Gill.
*Sphyradium edentulum* Charpentier. L. Semerwater.
*Pyramidula rupestris* Drap. L. Semerwater and Whitfield Gill.
*P. rotundata* Müller.
*Hygromia rufescens* Pennant.
*H. rufescens* v. *albocincta* Cockerell. Whitfield Gill.
*H. rufescens* v. *alba* Moquin.
*H. rufescens* v. *rubens* Moquin-Sandon W.E.L.W.[1]
*H. hispida* Linné. R. Semerwater.
*H. granulata* Alder. R. Semerwater.
*Cochlicopa lubrica* Müller.
*C. lubrica* v. *lubricoides* Fér. L. Semerwater and Whitfield Gill.
*C. lubrica* v. *ovata* Jeffreys. L. Semerwater.
*Jaminia muscorum* Drap. L. Semerwater.
*Clausilia laminata* Montagu. Whitfield Gill.
*C. bidentata* Ström. Whitfield Gill.
*C. cravenensis* Taylor. W.E.L.W.
*Balea perversa* Linné. R. and L. Semerwater and Whitfied Gill.
*Carychium minimum* Müller.
*Succinea putris* Linné. R. and L. Semerwater.
*S. elegans* Linné. L. Semerwater.
*Limnæa peregra* Müller. L. Semerwater.
*Ancylus fluviatilis* Müller. L. Semerwater.

Flora of the Woodland by the River Bain (J. M. Brown) Although the small area of woodland on the slope of the hillside by the River Bain, between Bainbridge and Semerwater, contained no plants of special rarity, it nevertheless was of considerable interest, owing to the large variety in its ground flora (about one hundred species of flowering plants were enumerated in a rather rapid survey), and in the distribution of the dominant plants. The area formed essentially an open woodland association, the dominant trees being Hazel and Hawthorn, with occasional Holly, Ash, and Sycamore, one or two Larch, and in the neighbourhood of the small tributary becks, Mountain Ash and Sallow, and by the river-side, Alder. At the lower end of the wood was a group of Blackthorn. Many of the Holly and Ash trees were densely encumbered with Ivy in full fruit. Tangles of Wild Rose were common. The abundance of seedlings of various ages and young individuals of Hawthorn, Ash, and Mountain Ash suggested the absence of browsing mammals, but the accumulations of gnawed hazel nuts at the base of many of the trees, pointed to the presence of rodents of

[1] Where the initials W.E.L.W. appear, these species were collected by Mr. W. E. L. Wattam, but no locality was stated.

some kind, possibly mice (squirrels being apparently absent). The Tawny Owl was both heard and seen in this wood by the recorder.

In the more open spaces in the upper part of the wood, the dominant ground plants among the grass were *Primula vulgaris, Alchemilla vulgaris, Potentilla Fragariastrum, Conopodium majus* (Pignut) with *Viola Riviniana, Ranunculus ficaria,* and *Luzula campestris.* Hereabouts *Ophioglossum vulgatum* occurred in plenty, and on the still higher ground *Botrychium Lunaria.*

In the more shady parts among the trees, *Allium ursinum, Scylla nonscripta,* and *Mercurialis perennis* dominated different areas, and associated with these species were *Anemone nemorosa, Sanicula europæa, Arum maculatum, Ranunculus auricomus* (Goldilocks), *Stellaria Holostea,* and *Veronica montana.* In the damper parts occurred *Caltha palustris, Cardamine pratensis, Chrysosplenium oppositifolium,* and *Spiræa Ulmaria,* and by the river-side *Trollius europæus* was just coming into flower.

In an area of bogland near the river, besides the usual *Spiræa Ulmaria, Caltha palustris, Mentha* sp., etc., were *Valeriana dioica* (Marsh-Valerian), *Cardamine amara, C. flexuosa, Geum rivale, Lysimachia nemorum,* last season's fruit *Narthecium ossifragum,* and a Sedge not yet in flower (probably *Carex acutiformis*), and in the river itself, near Semerwater *Nymphæa lutea* (Yellow Waterlily) was in flower.

Among the more locally distributed species may be noted, *Primula vera* (Cowslip, very few), *Geranium sylvaticum* (not yet in flower), *Circæa lutetiana* (Enchanter's Nightshade), *Adoxa Moschatellina, Asperula odorata, Listera ovata* (Twayblade, very restricted), and *Orchis mascula.*

Ferns were unfolding abundantly, and some of the more open areas would later in the season be dominated by Bracken. In this wood Mr. Cheetham found *Equisetum variegatum.*

*Primula farinosa* did not occur even in the open parts, though it was in flower at the lower end of Semerwater ; and it is noteworthy that *Lychnis dioica, Stellaria nemorum, Lathyræa Squamaria, Myosotis* sp., and *Luzula sylvatica* were not seen, although all were very plentiful in Mill Ghyll.

Bryology (F. E. Milsom) : In common with the other sections, the bryological investigation of Semerwater suffered by reason of the fact that sufficiently near approach could not be made to the lake-side. The same superabundance of water applied to the streams running into the lake, and very little could be done. A general survey of the district calls for no comment except perhaps the fine fruiting of many moss species, *Tortula subulata* and *T. ruralis* being particularly good. In contrast to the poor conditions, however, which applied to the lake, there was good working ground in Mill Gill and Whitfield Gill, and a very satisfactory day was spent there. Of the commoner species, the most noteworthy feature was the abundance of *Eurynchium striatum* ; *E. prælongum* var. *Stokesii* and forms approaching the variety were also common. Of rarer species, *Seligerias* were fruiting well, and mention must also be made of *Hylocomium triquetrum,* which was found with fruit. This moss, though common in the sterile condition, is exceedingly rare in fruit. Hepatics, although frequent, were of the commoner kinds, and justify no particular remarks. In all, 85 species of mosses and 30 species of hepatics were seen during the week-end, of which the following are the most interesting :—

Mosses.

| | |
|---|---|
| *Seligeria Doniana* C.M. c.fr. | *Eurynchium crassinervium* B. & S. |
| *S. pusilla* B. & S. c.fr. | *E. prælongum* Hobk. var. *Stokesii* Brid.[1] |
| *S. tristicha* B. & S. | *Amblestegium Sprucei* B. & S. |
| *Weisia verticillata* Brid. | *Hylocomium triquetrum* B. & S. c.fr. |

[1] New to V.C. 65.

HEPATICS.

*Metzgeria pubescens* (Schrank) Raddi. *Cololejeunea Rossettiana* (Massal.) Schiffn.
*Lophozia turbinata* (Raddi) Steph.
*Calypogeia arguta* Nees et Mont.

LICHENS (W. E. L. Wattam) : The wet conditions were most favourable for observations upon these plants. The full beauty of the many species which denizened the boundary walls (which consisted of limestone and rocks of the Yoredale series) alongside the highway to Marsett was seen to perfection. The species occurring are fully set out in my report upon the lichens of the Stallingbusk side of Semerwater appearing in *The Naturalist*, September, 1931, pp. 278-280. The only additions are *Lecanora galactina Ach* subsp *dispersa* Nyl., *Rhizocarpon petræum* Massal, and *Gylecta cupularis* Schær. The trees at the Marsett end of the lake are chiefly Alder and Crack Willow, whose boles are covered with an intermingled wealth of *Parmelia physodes* Ach., *P. saxatilis* Ach., *P. fuliginosa* var. *lætevirens* Nyl., *P. sulcata* Tayl., and patches of *Cetraria glauca* Ach., and *Evernia furfuracea* Fr.

Whitfield Gill has an interesting lichen flora. The boles of Ash, Mountain Elm and Sycamore in particular are densely clothed with *Cetraria glauca* Ach., *Evernia furfuracea* Fr., *Parmelia physodes* Ach., *P. saxatilis* Ach., and its form *furfuracea* Schær, and *Pertusaria pertusa* Dalla. The wall tops, comprised of stones of the Yoredale series, are absolutely dominated by *Cetraria glauca* Ach., *Evernia furfuracea* Fr., and *Parmelia saxatilis* Ach. Here also was noted a weak form of *Cladina sylvatica* Hoffm. and *Cladonia gracilis* var. *chordalis* Flocrke, both amongst mosses on the ground. Also *Opegrapha atra* Pers. on Ash boles and *Parmelia omphalodes* Ach. on silicious boulders.

An investigation of High Gill on the way to Stallingbusk resulted in *Opegrapha varia* Pers. on an exposed Ash root, and an abundance of *Collema pulposum* Ach. being noted.

ENTOMOLOGY (J. M. Brown) : The week-end was entirely unsuited to entomological collecting, the weather being either too wet or too windy, but later in the following week conditions improved, and by Thursday insects were much more numerous and obtrusive. The sunshine on these days brought out the Humble-bees and Wasps in considerable number, and Whites and Tortoise-shells among the butterflies were about in quantity. On these days also Stone-flies, which were hardly to be seen at the week-end, became quite numerous about the streams. It was too early in the season for Hemiptera and Neuroptera, and few of these insects were taken. Beetles and Dipterous flies were the commonest insects about. Comparatively few Ants were noted, but *Myrmica rubra* occurred in the woods.

HEMIPTERA : The most interesting species taken were *Dipsocoris* (*Cryptostemma*) *alienum* H.S., found among the stones by the stream-side in Mill Gill, thus adding another locality for this local species, and the immature stage of *Micronecta minutissima* L., which occurred in enormous numbers in Semerwater and in the River Bain. Adults should be plentiful in a week or so. Other species taken included :
*Velia currens* F.
*Acanthia saltatoria* L.
*Anthocoris nemorum* L. and *A. confusus* Reut.
*Stenodema holsatum* F.
*Monalocoris filicis* L.
*Brachyceræa* (*Dicyphus*) *stachydis* Reut.
*Thamnotettix prasinus* Fall., *T. dilutior* Kbm., and *T. subfuscula* Fall.
*Dikraneura variata* Hdy.
*Delphacodes discolor* Boh. and *D. denticauda* Boh., this last new to Yorkshire.

NEUROPTERA : Though not plentiful several Lacewing-flies were beaten in the woods, including :
*Hemerobius micans* Oliv., *H. humulinus* L., and *H. stigma* Steph.
*Boriomyia nervosa* Steph.
and a single individual of the Scorpion-fly, *Panorpa germanica* L. was seen.

TRICHOPTERA : Caddis-flies were remarkably scarce and only two species were obtained, *Limnophilus sparsus* Curt. and *Rhyacophila dorsalis* Curt.

EPHEMEROPTERA : Imagos were very few in number but towards the end of the week subimagos became fairly common. The only adults taken were *Bætis pumilis* Burm. and *Ecdyonurus venosus* F.

PLECOPTERA : Adult Stone-flies, scarce at the week-end became quite numerous later, and included :
*Chloroperla grammatica* Scop.
*Isopteryx torrentium* Pict.
*Leuctra inermis* Kmpy.
*L. hippopus* Kmpy.
*Protonemura meyeri* Pict.
*Nemoura variegata* Oliv.
*N. cambrica* Steph.
*Amphinemura cinerea* Oliv.
*A. marginata* Pict.

COLLEMBOLA : A few Springtails were collected in passing, including :
*Xenylla grisea* Axels.
*Neanura muscorum* Templ.
*Isotomurus palustris* (Müll.).
*Entomobrya nivalis* (L.).
*Tomocerus minor* Lubb.

DIPTERA.—Chris. A. Cheetham says : The only opportunity to collect flies was in Park Gill in a corner protected from the strong wind of Monday and where the warmth of the sun could be felt. Among the Limnobids were two species of *Tipula, vittata* Mg. and *subnodicornis* Ztt., *Empeda nubila* Schum., and *Ormosia* (*Rhypholopus*) *lineatus* Mg. A few Mycetophilids included *Boletina trivittata* Mg., *Mycomyia marginata* Mg., *Mycetophila ornata* Steph. (*rufescens* auct nec Zett.), and *Phronia forcipula* Winn. Among the other groups were *Tephritis ruralis* Lw., *Rhyphus punctatus* F., *Syrphus ribesii* L., *S. vittiger* Ztt., *S. arcticus* Ztt., *Sphegina clunipes* Fal., *Prodiamesa olivacea* (Mg.) Edw., *Rhamphomyia nitidula* Ztt., *Scatophaga suilla* F., *S. squalida* Mg., *Bucentes* (*Siphona*) *cristata* F., and *Onesia cærulea* Mg.

COLEOPTERA : Mr. Maurice D. Barnes reports that the following Beetles were met with along the route from Bainbridge to Semerwater and Stallingbusk. The weather was very disappointing, few insects of any sort being found. Most of the Beetles captured were taken from beneath stones on moss, the majority being ground Beetles. Very few of the sun-loving species were in evidence. The dead body of a rook yielded the two carrion-feeding species of *Necrophorus*.
*Cychrus rostratus* L.
*Carabus catenulatus* Scop.
*Nebria gyllenhalii* Sch.
*N. brevicollis* F.
*Loricera pilicornis* F.
*Clivina fossor* L.
*Pterostichus niger* Schall.
*Abax ater* Vill.
*Ontholestes* (*Leistotrophus*) *tessellatus*. Fc.
*Necrophorus humator* Goez.
*N. mortuorum* Fab.
*Coccinella-Septempunctata* L.

*Phosphuga atrata* L.
*Aphodius rufies* L.
*Hypnoidus* (*Cryptohypnus*) *riparius* F.
*Hydrothassa marginella* L.
*Phyllodecta vitellinæ* L.
*Aphidicta* (*Adalia*) *obliterata* L.

Report of the Vertebrate Section.—W. F. Fearnley writes: The only wild Mammals noted were Hare, Rabbit, Mole, and Vole. On Sunday in Whitfield Gill several Jackdaws were seen near Mill Gill Foss, also Missel Thrush, Song Thrush, Blackbird, Starling, Redbreast, Wren, Spotted Flycatcher, Chaffinch, and Willow Warbler. Near Whitfield Foss a family of Marsh Tits were being fed, and a Dipper was seen to fly through the Foss several times. Yellow Wagtails and Pied Wagtails were seen near the small reservoir, and a flock of about a dozen Wood Pigeons flew out from the Gill.

On Askrigg Common were a few Curlew, Green Plover, Golden Plover, Grouse, Meadow Pipits, and Redshank. At Summer Lodge Tarn was a gullery with sixty Black-Headed Gulls' nests, and three Common Sandpipers were seen in the vicinity.

In the evening the collection of locally obtained stuffed birds at Carr House was visited. The collection included an immature Gannet, Heron, Long-Eared Owl, Sparrow Hawk, Kingfisher, Shelduck, Wigeon, and Teal.

On Monday, two Great Crested Grebes were seen on Semerwater, and no other birds were noted on the water, probably owing to the strong wind which made the surface very rough. Amongst the trees on the north shore were Blackbird, Redbreast, Wren, Starling, Chaffinch, Tree Pipit, Meadow Pipit, Blue Tit, Marsh Tit, Willow Warbler, Common Sandpiper, and Waterhen, and a Sparrow-Hawk's feather was picked up. On the open shores of the lake were Yellow Wagtail, Pied Wagtail, Grey Wagtail, Redshank, and Green Plover. Carrion Crow, Rook, Heron, and Black-Headed Gulls were seen flying over. In the wood a little to the west of Semerwater were Song Thrush, Dipper (by the stream), and Wood Pigeon. The following species were also noted during the day: Wheatear (on Addleborough), House Sparrow, Swallow, House Martin (three nests attached to Y.N.U. Headquarters), Sand Martin, Swift, and Corncrake.

Freshwater Biology (Charles Allen): The heavy rains, both before and during the meeting, had flooded all waters in the district and the normal margins of Semerwater and the River Bain were inaccessible and most of the feeder streams were being scoured by torrents; it was, therefore, impossible to collect sufficient data to enable an accurate estimate of the freshwater life of the district to be made. The condition of the waters, however, was not exceptional but periodical, and an opportunity was provided of gauging the effect of such recurring floods on the aquatic flora and fauna.

As a result of periodical spates all feeder streams, and to a large extent the River Bain also, are deficient in patches of sediment in which water plants can flourish and consequently small aquatic animals, whose whole life cycle is spent in the waters, are absent.

It will be noticed in the lists appended to this report that the smaller crustacea, mollusca and insects, apart from larval forms with an aerial winged stage, were not in the streams, whilst the larvæ of various flies formed the dominant animal life. It would seem that the periodical scourings, to which the streams are subjected, prevent those creatures whose whole life is spent in the water from establishing themselves; whilst the larval forms of aerial insects are renewed from time to time.

An exception was found in the streams leading into the South-Western end of Semerwater. The lake is slowly silting up from this end and the

ground is flatter with more alluvial deposit and in this area *Limnæa peregra, Pisidia spp., Gammarus, Asellus,* and Planarians were plentifully found alongside the insect larvæ.

A visit was paid to Summer Lodge Moor where, at an altitude of 1,700 feet, in flooded pits choked with Sphagnum the Tipulids *Phalacrocera replicata* and *Tipula plumbea* were taken. Summer Lodge Tarn lies between the 1,700 and 1,750 feet contour and beyond being a nesting place for the black-headed gull seems to support no animal life whatever, a careful search of its margins resulting in a few stonefly larvæ (*Nemoura*) being taken. The waters examined and the species taken were :—

1. Feeder streams entering the River Bain from the North-West.

INSECTA.

*Trichoptera* : *Agapetus* and a few *Limnophilids.*
*Ephemeroptera* : *Ecdyonurus, Heptagenia, Leptophlebia, Bætis Centroptilum.*
*Hemiptera* : *Velia currens.*
*Diptera* : *Chironomus, Tanypus, Simulium.*
*Coleoptera* : *Helmis.*

MOLLUSCA.

*Ancylus fluviatilis* : *Pisidia spp.*

VERMES.

*Planaria alpina* ; *Polycelis cornuta.*

2. River Bain, accessible at one spot only.

INSECTA.

*Ephemera danica* and *Sialis lutaria.*

MOLLUSCA.

*Anodonta cygnaea* : *Pisidia spp.*

3. Whitfield Gill.

INSECTA.

*Trichoptera* : *Plectrocnemia.*
*Ephemeroptera* : *Ecdyonurus and Bætis.*
*Perlidæ* : *Chloroperla, Protonemura, Amphinemura.*

VERMES.

*Tubifex* (occasional).

4. Feeder streams entering Semerwater from the south west.

INSECTA.

*Trichoptera* : *Limnophilids, Plectrocnemia, Rhyacophila.*
*Ephemeroptera* : *Ecdyonurus.*
*Perlidæ* : *Perla cephalotes.*
*Diptera* : *Stratiomys.*
*Coleoptera* : *Hydroporus spp.*

MOLLUSCA.

*Limnæa peregra* ; *L. truncatula* ; *Pisidia spp.*

CRUSTACEA.

*Gammarus pulex, Asellus aquaticus, Cypris.*

VERMES.

*Planarians.*

5. Summer Lodge Moor.
In flooded pits full of *Sphagnum*: *Tipula plumbea, Phalacrocera replicata.*

6. Summer Lodge Tarn.
Three specimens of *Nemoura.*

---

At a meeting of the Mineralogical Society on March 15th, Mr. A. Russell described some beautiful colourless crystals of barytes from the Manvers Main Colliery, Yorkshire.

In *The North Western Naturalist* for March, Vol. IX, we read that a Sabine's Gull, shot at Bridlington on December 2nd, 1907, and hitherto unrecorded has now been presented to the Yorkshire Philosophical Society's Museum by Mr. C. Allen, of Strensall.

## Y.N.U. CONCHOLOGICAL SECTION.

### Field Meeting at York, 2nd June, 1934.

The Joint Meeting of the Conchological Section with the Yorkshire Conchological Society and the York and District Field Naturalists was held at York on 2nd June.

The area investigated was around the Acomb Brick Ponds, one and a half miles S.W. of York Railway Station.

The day being warm, dry, and sunny, the ground surrounding the ponds was not in ideal condition for mollusca, and more attention was paid to the waters. However, the following land species were observed :—

| | |
|---|---|
| *Agriolimax agrestis v reticulata* | (Moquin Tandon) |
| *Vitrea alliaria* | (Miller). |
| *Helicigona arbustorum* | (Linné). |
| *Helix hortensis* | (Müller). |

From the ponds the following were recorded :—

| | |
|---|---|
| *Limnæa peregra* | (Müller). |
| *L. stagnalis* | (Linné). |
| *Planorbis corneus* | (Linné). |
| *P. contortus* | (Linné). |
| *P. albus* | (Müller). |
| *P. umbilicatus* | (Müller). |
| *Physa fontinalis* | (Linné). |
| *Anodonta cygnaea v anatina* | (Linné). |
| *Sphaerium corneum* | (Linné). |

In the evening the River Ouse was visited at Clifton Ferry and the following species were taken :—

| | |
|---|---|
| *Limnæa peregra* | (Müller). |
| *L. auricularia* | (Linné). |
| *Bithynia tentaculata* | (Linné). |
| *Vivipara vivipara* | (Linné). |
| *Neritina fluviatilis* | (Linné). |
| *Unio pictorum* | (Linné). |
| *Pisidium amnicum* | (Müller). |

Charles Allen.

---

## REVIEWS AND BOOK NOTICES.

**The Barn Owl in England,** by **G. B. Blaker.** Published by the Royal Society for the Protection of Birds. 16 pp., price 1s. This carefully prepared and most valuable report will be welcomed by all naturalists. The Barn-owl is becoming a rare bird as Mr. Blaker's census shows. The author tries to get at the reasons for this alarming decline, which has accelerated during the past ten years. Among the most likely causes of excessive mortality among Barn-owls that of poison is given. The author is inclined to believe that rats and mice enfeebled by poisons such as phosphorus arsenic, barbium or strychnine, all of which are used in ' rat poisons,' fall an easy prey to the Barn-owl, which is poisoned as a consequence. The report contains excellent distribution maps and can be strongly recommended.

**Island Days,** by **R. M. Lockley,** with sketches by D. Lockley ; pp. 120, price 7s. 6d. Messrs. H. F. and G. Witherby. Those who liked the author's ' Dream Island ' will want to read this book and will not be disappointed. There are some people who will not envy the author and his family, but most true naturalists would like to change places with him for a few months if not for the whole year. The island of Skokholm is not in the Baltic as might be expected from its name, but is within a mile or two of Pembrokeshire. Although only a mile

across it has a teeming population of wild creatures and is in season literally carpeted with wild flowers. As might be expected, there are plenty of birds, although woodpeckers, magpies, and jays have not been seen. The author's style is most pleasing and appropriate to the subject. There is a good deal to be said for playing at the game of Robinson Crusoe and this is the way to do it.

**The Behaviour of Animals**—An Introduction to its Study, by **E. S. Russell, D.Sc., F.L.S.** pp. viii+184, with six plates, price 10s. 6d. Messrs. Edward Arnold and Co. A work of this kind has been wanted for some time past. Dr. Russell is to be congratulated on his straightforward, readable, but nevertheless, strictly scientific treatment of a notoriously difficult subject. While no one could accuse the author of interpreting animal behaviour on humanistic lines, he shows very clearly that purely mechanistic theories are invalid and indicates what an immense field for research is awaiting exploration by both academic scientific workers and the lay field-naturalist. Even lowly forms of life exhibit individuality and the first-hand observations of those whose work or recreation brings them into close contact with wild life provide valuable material for investigation. Dr. Russell has provided a manual of method which should be in the hands of all naturalists who are seeking guidance in the interpretation of their field observations.

**From Track to By-pass**—A History of the English Road, by **T. W. Wilkinson.** pp. xvi+240, with 39 photogravure plates and 15 illustrations in the text, price 10s. 6d. Messrs. Methuen and Co., Ltd. How did our roads begin? What was the turnpike system? How have roads been maintained during the last thousand years? These and countless other questions are very completely answered in this very fascinating book. It is all so good that to place emphasis on any one section would do less than justice to the author. Even the most experienced pedestrian will find some surprises. For example, one is so accustomed to hear of the ' old coaching days ' that it comes somewhat as a shock to discover that the stage coach came into being, had its time of prosperity, and disappeared in a period of years less than the modern railway era—and perhaps railways may follow the horse-coaches! Everyone uses the roads nowadays, and Mr. Wilkinson gives some account of modern developments, the revival of roadside inns, the reconstruction, widening and straightening of main roads, and says something of the immense cost of it all. At the beginning of the nineteenth century turnpike roads were made for £1,000 to £2,000 per mile, while some modern roads are costing anything from £80,000 to £160,000 per mile. The illustrations are worthy of the text and this is saying a good deal.

**Rex-Furred Rabbits,** by **W. King Wilson.** (Bulletin No. 73 of the Ministry of Agriculture and Fisheries). pp. vi+14, price 1s. H.M. Stationery Office. This useful little pamphlet describes a very complete series of experiments in rabbit breeding for the purpose of producing a pelt of a quality comparable with those obtained from much more expensive fur-bearing animals. The original rex-coated rabbit was apparently a mutation which occurred in France about ten years ago and quickly became established as a new breed. Inter-breeding experiments gave results in accordance with Mendelian principles and to-day rex-coated rabbits are available in many varieties of colour. It should be explained that the coat of the breed in question is much more useful and attractive to furriers than that of the normal rabbit. The pelt produced is more velvety and shows an almost complete absence of the long so-called ' guard-hairs ' which must be removed from normal rabbit fur in order to eradicate the ' rabbity ' appearance. The pamphlet is well illustrated by monochrome photographs and by photographs in colours of various pelts, and should be read by naturalists interested in practical applications of the Mendelian theory.

## NEWS FROM THE MAGAZINES.

In *The Geological Magazine* for April, W. Hopkins describes *Lingula* Horizons in the Coal Measures of Northumberland and Durham.

The question of the Lower Palæozoic Rocks of Austwick and Horton-in-Ribblesdale is fully discussed in *The Quarterly Journal of the Geological Society*, No. 357, by W. B. R. King and W. H. Wilcockson.

Among the memoirs published in Part II of *The Summary of Progress of the Geological Survey*, is the Lower Ordovician Graptolite Faunas with special reference to the Skiddaw Slates, by Dr. Gertrude L. Elles.

The original map of the Proposed Aire and Dunn Canal, by William Smith, drawn on stone by J. Phillips, 1819, which was illustrated in this Journal for 1912, page 282, has been presented to the Geological Society of London by Mr. T. Sheppard. It is the only example known.

The *Daily Mirror* for April 17th contains a photograph entitled ' Huge bones found at Hurley, Berks. They are believed to be those of a brontosaurus which lived over 50,000 years ago.' Why the brontosaurus which was never in England, and why 50,000 years ago, is a bit puzzling, seeing that the bones are clearly those of an elephant, possibly mammoth.

A well-illustrated report of the Excavations of the Roman Fort at Brough on Humber, by Philip Corder, has now been published by arrangement with the East Riding Antiquarian Society, and it can be obtained from Mr. H. F. Bing, University College, Hull, for one shilling plus postage. There are plans of the excavations, photographs of the various trenches, etc., and drawings of the fine collection of pottery and objects in bronze, bone, and glass, as well as a list of the Roman coins found, all of which can be seen in the Mortimer Museum at Hull, where they will be permanently exhibited.

Our contributor, T. Hyde-Parker, in a note on ' A Humble Friend,' in the Spring Number of *Bird Notes and News*, says : ' If one may judge by the number of popular and local names which have been bestowed on it at one time and another, few birds of our countryside are better known than the modest little Hedge-Sparrow. As Dunnock, Hempie, Shuffle-wing, Cuddy (our East Yorkshire name), and a dozen other appellations, the little chap seems universally noted, despite his quiet ways and inconspicuous appearance, and is too much of a general favourite for the " Hedge Accentor " of the ornithological purist to be ever generally adopted.'

*The Entomologist's Record* for April contains ' Lepidoptera at Maurin, Barres Alpes, France,' by W. P. Curtis ; ' Nature in 1933,' by A. J. Wightman ; ' Notes on a list of generic names of British Butterflies,' by L. G. Higgins ; ' Nomenclature. The List,' by H. J. Turner, ; ' The Colorado Beetle,' by J. C. F. Fryer (including the Ministry of Agriculture and Fisheries Advisory Leaflet, No. 71, with coloured plate. The Colorado Beetle has twice appeared in this country at Tilbury in 1902 and 1933 and is only too likely to settle in England if given a chance.) ; ' Notes on Collecting and Supplements " British Noctuæ," ' by H. J. Turner, and ' Butterflies of the Upper Rhone Valley,' by R. Verity.

*The Entomologist* for April contains ' On *Hemimene flavidorsana* Knaggs, *quaestionana* Gill, *alpinana* Tr., *politana* Hb., and *peteri-verella* L. (*Lep. Tortricidae*),' by F. N. Pierce and J. W. Metcalfe ; ' New Names for three genera of Rhopalocera,' by F. Hemming ; ' Notes on the Geographical Variations of *Argynonome paphia* L,' by R. Verity ; ' On the Sexes of some South American Moths attracted to Light, Human Perspiration and Damp Sand,' by C. L. Collenette ; ' A new Palearctic Lycaenid Butterfly,' by N. D. Riley (*Lycaenopsis filiipjevi*) ; ' A Collecting Trip in the Vosges and Bas-Rhine districts of France : Trichoptera, Pleuroptera and Neuroptera,' by M. E. Mosely ; and numerous notes and observations.

*The Naturalist*

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# LAYERING BEECHES IN LEEDS.

J. H. PRIESTLEY.

When the beech, *Fagus sylvatica* L., is growing under open parkland conditions, the lower branches develop very vigorously, so that the canopy of the crown spreads over a very wide area at a height little above the ground level. In well-grown trees of considerable age some of these lower branches may occasionally lie upon the surface of the ground when the branch, through part of its course, becomes gradually covered with leaf mould. In time such branches may develop roots and this is almost always followed by a vigorous upward growth of shoots, which emerge from buds situated close to the region of root production, though a little further outward on the branch from the main trunk. These branches usually

**Branch of Layering Beech.**
AB=approximately 5 ft.

grow vertically upward and may develop into quite strong vigorous branch systems so that the original tree appears to be surrounded by a circle of vigorous young trees, though closer observation will show that these are actually branch systems of the parent tree in the middle. Such branches may be severed from the trunk and continue to live as independent trees and this manner of vegetative propagation, in which some of the lower branches behave as rooting stolons, is known as layering. Layering trees are only found in a few old examples of the tree growing under favourable conditions. Elwes and Henry in *The Trees of Great Britain and Ireland* (Edinburgh, 1906) describe the self layered beech at Newbattle



AUG 1 3 1934

Abbey near Dalkieth, eight miles from Edinburgh, as ' the most remarkable, if not the largest, of all the beeches of park or spreading type now standing in Britain.' This beech, which is growing in light alluvial soil, not far from a branch of the North Esk river, is illustrated in two plates in this work and was estimated at that date to be 300 years old or more. Elwes, in 1904, estimated its height at 105 ft., its girth at about 5 ft. was 21 ft. 6 ins. ; the circumference of the foliage, measured on August 25th, 1903, by Mr. John Ramsay, was given at 400 ft. Examples of layering beeches were also to be seen at Kew Gardens, but it certainly seems worth while to place on record a few particulars about three fine layering beeches that are to be seen within some two miles of the centre of the city of Leeds. These trees are in the grounds of Mr. Peter Longley, Potternewton House, Potternewton Lane. In two cases the branches which are rooting are still in contact with the parent tree, in the third case most of the rooting branches have been sawn off at the main trunk, but the layering habit is still clearly recognisable.

The following particulars may be given of these three trees :

(1) Beech near Drive Entrance.

Girth at base about 11 ft. Six main rooting branches. One of them, 10 ins. around as it approaches the ground, gives after rooting three main branches of 20 ins., 22 ins. and 27 ins. circumference respectively. Another of 8 ins. after rooting bears an erect branch of 12 ins. and a large sloping branch 33 ins. circumference ; from the latter a narrow branch continues to root again giving an erect branch of 25 ins. circumference. Another branch of 11 ins. after rooting gives an erect branch of 21 ins. and a sloping branch of 31 ins. circumference.

The canopy of this tree covers a periphery of roughly 350 ft. In addition to the main rooting branches in this tree several slender branches had only rooted within comparatively recent times.

(2) Beech in Front of House.

This tree has no definite trunk but splits into a large number of main branches from the ground level. One of these has already fallen but the rest together have a girth at the base of some 15 ft. 9 ins. Six large branches have rooted in this tree and the periphery of the canopy is some 320 ft.

(3) Beech to the Side of the House.

The rooting branches of this tree have been cut away from

**Layering Beeches near Leeds.**

In the foreground are two large erect rooted branches, and one smaller one. Between the large erect branches can be seen the slender branch from which they have arisen, which can be traced back to the main trunk.

the trunk. The number of main rooting branches was at least seven, one branch after rooting had a circumference of 50 ins., branches from this had again rooted, one vertical rooted branch having a circumference of 42 ins. at 3 ft. from the ground. The canopy of this tree covered some 410 ft.

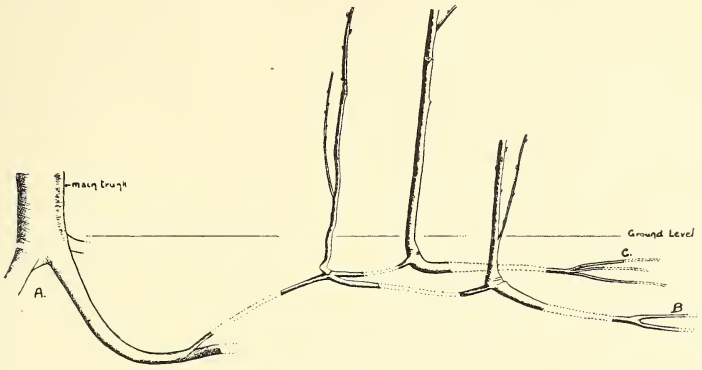
One striking point in the above record and which is illustrated in the photograph (Page 171) is the fact that the original branch is much more slender before than after rooting, although the rooted portion is a continuation of the slender branch and at a greater distance from the parent trunk. The reason is obvious. Cambial activity, by which the increase in thickness of the stem is brought about, is initiated afresh each growing season in the buds and from thence the impetus to radial growth spreads basipetally from twig to branch and thus to the main trunk. But in the case of these rooted branches the impetus to cambial activity finds its way from the vigorously rooted shoot into its root system and little or no cambial activity continues onward, along that part of the branch which intervenes between the new rooting system and the main trunk. This portion of the rooted branch grows but little in thickness therefore after the branch has once developed a vigorous rooting system ; presumably there is but little exchange of supplies, either of water or food, between the newly rooted branch system and the main trunk.

In the case of such rooted branches cambial activity probably persists, if slight in amount, along the line of union, because the basipetal tendency to renewal of cambial activity would naturally take this direction, from distal to proximal end of the branches, when cambial activity is renewed each year in the tree. The behaviour of a branch system linked to the parent tree by a root, instead of a branch, as is the case in *Populus canescens* Sm., will be entirely different.

The point is illustrated in the text figures. In the beech the rooting branch is shown growing from a trunk which lies to the left of the figure, as this branch is followed to the right it gradually becomes more slender except for the regions where it is swollen by the increased cambial activity working downwards from the vertical branch and along the branch for a short distance until it is diverted into the branches of the root system. Tracing the original horizontal branch outwards to the right, as soon as it is past such a vertical rooted branch it is immediately a slender branch again. Evidently the basipetal cambial activity spreading downwards from the vertical branch does not spread basifugally at all along the distal portion of this horizontal branch.

In *Populus canescens*, on the other hand, a root is similarly shown emerging from a parent tree on the left and carrying

erect shoots at intervals. In this root system the normal basipetal course of cambial activity is down the main trunk and then outwards towards the distal end of the root system. In accordance with this fact it will be noticed that the basipetal




**Populus Canescens.**
AB=8 ft. approximately. AC=7 ft. 6 ins. approimately.

impetus from the erect ' sucker shoots ' when it reaches this horizontal system spreads along it to the right, towards the distal end of the root system. There is no tendency for the root system to be thickened towards the parent tree as in the beech.

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## THE SOCIETY FOR BRITISH ENTOMOLOGY.

In these days when so much is published in the Entomological periodicals relating to continental and foreign insects, it comes as a pleasant relief to find a Society concerned with the study of British insects. The Society for British Entomology had developed from the Entomological Society of the South of England and it now makes an appeal to Entomologists all over the kingdom, numbers of whom are already enrolled in its list of members. The Society consists of Fellows, Honorary Fellows, Life and Ordinary Members, its affairs being conducted by a Council. It will publish *Transactions* and also a Journal containing shorter articles of entomological interest. The object of the Society is the study of British entomology and this object is likely to be attained if its publications continue the high standard previously achieved by those of the Entomological Society of the South of England. Mr. W. Parkinson Curtis, F.R.E.S., of Bournemouth, is President of the Society for 1934, and the Hon. Secretary, to whom application for membership should be made, is Mr. E. Rivenhall Goffe, 102 High Street, Southampton.

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*The Liverpool Geological Society* has published details of recent sections in the post-glacial deposits near Liverpool, by I. S. Double ; the Silurian Rocks of Kentmere, Westmorland, by R. C. Blackie ; and Calcareous Tufa near Spital, in the Wirral, by E. G. Hancox, in its recent *Proceedings*.

## RECORDS.

### LEISLER'S BAT AT BINGLEY.

In the early part of June, Mr. A. W. A. Swaine, Cottingley, taxidermist, submitted to me for identification, a specimen of a bat he had shot at Beckfoot Dam, Bingley. This proved to be a Leisler's or Hairy-armed Bat (*Nyctalus leisleri Kuhl.*). Mr. H. B. Booth confirms the identification and adds . . . 'that though this species of bat occurs at Barnsley, he has looked in vain for it in the Bradford district for many years, this being the first record for the area."

I have visited Beckfoot Dam with Mr. Swaine and had the pleasure of seeing Noctule, Leisler's and Pipistrelle Bats on the wing. The Leisler's Bats have a rapid flight, fly at a good height and appear to be more given to vertical zig-zag movements in the air than is the case with the Noctule. In addition to the specimen of Leisler's Bat now in the museum at the Cartwright Memorial Hall, Bradford, two others have been taken, all of them being males, whilst others have since been seen on the wing.—M. LONGBOTTOM.

[For more than thirty years I have tried to add this species to the fauna of Upper Airedale and Upper Wharfedale. Three were obtained by F. Bond from a chimney-shaft at Hunslet, Leeds, over ninety years ago (see Clarke and Roebuck's, *Yorkshire Vertebrata* p. 4.)—H.B.B.]

### TROUT FROM ULLSWATER AND WINDERMERE.

The *Yorkshire Post*, June 19th, 1934, states that experts from the Freshwater Biological Association of the British Empire recently took samples of the trout in Ullswater, and have reported, among other things, that the rate of growth is as follows :—In the first year they grew to 1·9 inches, in the second to 4·9 inches, in the third to 7·1 inches, and in the fourth to 8·8 inches. For the first three years this rate of growth is similar to the rate of growth of Windermere fish, though there is an indication in the fourth year of a falling off compared with Windermere fish.

The scales suggest that this year the Ullswater fish spawned about two months later than the Windermere fish. The Ullswater fish spawn in their second year, and subsequent winters, whereas the Windermere fish usually spawn for the first time in their third year.

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R. Stewart-Brown writes on ' The Pool of Liverpool ' in *The Transactions of the Historic Society of Lancashire and Cheshire*, Vol. 82.

Brian Simpson writes on ' The Petrology of the Eskdale (Cumberland) Granite ' in *The Proceedings of the Geologists' Association* for March 28th.

# THE ZONAL VALUE OF THE BETTER BED COAL.

JAMES WALTON, B.Sc.

In discussing the zonal value of the Better Bed Coal there are two factors worthy of consideration—the non-marine lamellibranch fauna and the flora. The marine faunas are not applicable to this investigation, as no marine bands have been recorded from the strata between the Halifax Hard Bed Coal and the Two Foot Marine Band.

## Non-Marine Lamellibranchs.

It has been pointed out by Dr. Wray and Prof. Trueman that there is a well-defined break at the horizon of the Better Bed in the non-marine lamellibranch sequence, and this has been adopted as the dividing line between the Lenisulcata Zone and the Ovalis Zone (1). The former is characterised by the presence of *Anthracomya lenisulcata* Trueman, *Anthracomya prisca* Trueman, *Anthracomya bellula* Bolton and *Carbonicola recta* Trueman, whilst *Carbonicola ovalis* Trueman, *Carbonicola communis* Davies and Trueman, *Carbonicola pseudorobusta* Trueman, *Carbonicola obtusa* Hind, and *Naiadites flexuosa* Dix and Trueman are dominant at the higher horizon.

## Floras.

The majority of attempts to sub-divide the Yorkshire Coal Measures have been based on floras, and the main difficulty has arisen in determining the position of the lower floral break. Further difficulties have resulted from the confusion in nomenclature, especially with regard to the term "Lanarkian." In his earliest account of the Yorkshire Carboniferous Flora, Kidston drew the dividing line between the Lower and Middle Coal Measures at the top of the Elland Flags (2), but in his later works he adopted the Silkstone Coal as his boundary, thus agreeing with the Geological Survey, although he gave no reason for this change. In Lancashire the Arley Mine Coal has long been accepted as the boundary, and as this has been shown by Dr. Wray to be the equivalent of the Better Bed Coal he adopted the Better Bed Coal as the boundary between the Yorkian and Lanarkian in Yorkshire (3). In support of this he pointed out that 'of fifty-five species recorded from the measures between the Better Bed and Silkstone Coals in Yorkshire, no less than twenty-six are practically confined to and characteristic of the Westphalian Series.' Dr. Crookall first adopted the Silkstone Coal as his boundary (4), but later reverted to the Better Bed (5) as a result of Dr. Wray's suggestions (6).

This confusion has resulted from two causes : (*a*) the fact

that Kidston did not realise the zonal value of such species as *Neuropteris schlehani* Stur, and (*b*) insufficient collecting from the measures between the Better Bed and Silkstone Coals. Dr. Crookall has indicated (4 and 5) that the Lanarkian is characterised by *Lyginopteris hoeninghausi* (Brongt.) and *Neuropteris schlehani* Stur and Dr. Dix agrees with this, although she prefers to refer to this zone as the Zone of *Neuropteris schlehani* and *Lyginopteris hoeninghausi* rather than as the Lanarkian (7, 8, and 9). Dr. Crookall, in his review of Dr. Dix's paper, is not in favour of this nomenclature, and so far as Yorkshire is concerned Dr. Crookall's use of Lanarkian seems preferable.

Since *Neuropteris schlehani* and *Lyginopteris hoeninghausi* have been established as characteristic Lanarkian forms, it remains to consider their distribution in Yorkshire. *Lyginopteris hoeninghausi* Brongt. is the dominant fossil at the horizon of the Halifax Hard Bed Coal, and it extends upwards to the Crow Coal. Kidston has recorded this plant from the Middle Coal Measures (11), but Dr. Jongmans regards this as being in error (12). He has also recorded the same species from the Black Bed and the White Rake Bed, but Dr. Wray and Dr. Crookall indicate that these records should be suppressed (6). Dr. Crookall points out that the plant from the White Rake Bed ' is not *Lyginopteris hoeninghausi* although it bears some resemblance to the lax form,' and ' that from the Black Bed cannot be confirmed as no specimen is available.' *Lyginopteris hoeninghausi* is quite plentiful at the horizon of the Black Bed Coal at Low Moor, and specimens from this locality are preserved in the Brighouse Museum. It must be pointed out that this species is more frequent below the Better Bed than above.

With *Neuropteris schlehani* Stur the reverse is the case, as this species attains its maximum frequency at the horizon of the Black Bed Coal, and it is particularly abundant at this horizon at Hartshead and Bradley. It is also common in a smutty coal seam just above the Elland Flags in Bradley Park, near Brighouse, and in the shales just below the Crow Coal at Harrison's Brickyard, Leeds. Specimens from the latter locality are preserved in the Bond Collection at Leeds University. *Neuropteris schlehani* is present also at the horizon of the Shertcliffe Coal in the Kirkheaton district. This plant persists, therefore, up to the Beeston Bed, and it seems advisable to adopt this as the boundary between the Lanarkian and Yorkian in Yorkshire, and this suggestion is in agreement with Dr. Dix (8 and 9).

Although the major floral break occurs at the horizon of the Beeston Bed there is a minor break at the Better Bed Coal, and it is proposed to sub-divide the beds below the

Beeston Coal into an upper and lower at the horizon of the Better Bed. It is intended to retain the term Lanarkian for these beds in the sense proposed by Dr. Crookall, and to refer to these sub-divisions as the Upper Lanarkian and the Lower Lanarkian. The Upper Lanarkian is characterised by a preponderance of *Neuropteris schlehani* Stur, together with *Alethopteris valida* Boulay and *Lyginopteris hoeninghausi* (Brongt.), whilst *Lyginopteris hoeninghausi* (Brongt.) is predominant in the lower division and is associated with *Neuropteris schlehani* Stur.

### The Upper Lanarkian Flora in Yorkshire.

Fossils have been collected from several horizons between the Elland Flags and the Beeston Bed, and Miss M. A. Johnstone recorded the following from the shales underlying the Better Bed Coal at the Bradford Brick Company's quarries (13) :

*Calamites varians* Sherub. var. *insignis* Weiss.
*Calamites suckowi* Brongt.
*Calamites ramosus* Artis.
*Sphenophyllum myriophyllum* Crépin.
*Mariopteris muricata* (Schloth.).
*Urnatopteris tenella* Brongt.
*Lepidodendron obovatum* Sternb.
*Zeilleria delicatula* Sherub.
*Zeilleria trichomanoides* Kidston.

The author has collected from a similar horizon at Bradley Park :

*Neuropteris schlehani* Stur forma *rectinervis* Kidston.
*Mariopteris acuta* (Brongt.).
*Alethopteris valida* Boulay.

A much more prolific flora is associated with the Black Bed, and the following have been collected from this horizon at Hartshead Pit, Clifton, Bradley Park (14) and Sheepridge :

*Alethopteris lonchitica* (Schloth.).
*Alethopteris valida* Boulay.
*Alethopteris* cf. *valida* Boulay.
*Alethopteris* sp.
*Mariopteris acuta* (Brongt.).
*Mariopteris* sp.
*Neuropteris schlehani* Stur.
*Neuropteris schlehani* Stur forma *rectinervis* Kidston.
*Lyginopteris hoeninghausi* (Brongt.).
*Renaultia gracilis* (Brongt.).
*Calamites undulatus* Sternb.
*Calamites suckowi* Brongt.

*Calamites carinatus* Sternb.
*Calamites* sp.
*Annularia radiata* Brongt.
*Annularia* cf. *radiata* Brongt.
*Asterophyllites charaeformis* (Sternb.).
*Lepidodendron* sp.
*Lepidophyllum* sp.
*Sphenophyllum myriophyllum* Crépin.

*Neuropteris schlehani* is dominant at this horizon, and it occurs in several forms. A sporocarp of this plant has also been collected from Hartshead. At the horizon of the Crow Coal *Neuropteris schlehani* is still very plentiful, and specimens are preserved in the Bond Collection at Leeds University which were collected at Harrison's Brickyard, Leeds. From a similar horizon at Sheepridge the following flora has been obtained :—

*Neuropteris schlehani* Stur forma *rectinervis* Kidston.
*Mariopteris muricata* (Schloth.).
*Asterophyllites charaeformis* (Sternb.).
*Alethopteris valida* Boulay.
*Pinnularia capillacea* L. and H.
*Calamites suckowi* Brongt.

No plants have been recorded from the measures between the Crow Coal and the Beeston Bed, and at the latter horizon *Neuropteris schlehani* is represented by a single specimen from the Shertcliffe Coal at Kirkheaton.

A fairly extensive flora has been collected by Bond from this horizon in the Leeds district, among which are the following :—

*Sphenophyllum cuneifolium* (Sternb.).
*Diplotmema furcatum* (Brongt.).
*Sphenopteris footneri* Marrat.
*Mariopteris muricata* (Schloth.).
*Alethopteris lonchitica* (Schloth.).
*Alethopteris valida* Boulay.
*Neuropteris heterophylla* Brongt.
*Lepidophloios acerosus* (L. and H.).
*Calamites suckowi* Brongt.

The above assemblage is Yorkian in character, and as *Neuropteris schlehani* does not extend above this horizon it is considered advisable to adopt the Beeston Bed as the dividing line between the Yorkian and Lanarkian in Yorkshire.

## Conclusions.

There is a definite faunal break at the horizon of the Better Bed Coal in Yorkshire, evidence for which is afforded by the non-marine lamellibranchs.

There is only a minor corresponding floral break at this horizon, the major break occurring just below the Beeston Bed. This is further support of Dr. Crookall's contention that the floral and faunal zones are not interchangeable (10.)

From the stratigraphical point of view it is advisable to retain the sub-divisions proposed by Dr. Wray (6) and to adopt the Better Bed Coal as the dividing line between the Lower and Middle Coal Measures, but it must be noted that this does not correspond with the boundary between the Lanarkian and Yorkian which must be taken at the horizon of the Beeston Bed.

It is also proposed to sub-divide the Lanarkian into an Upper and Lower at the horizon of the Better Bed.

The following table illustrates the various zones which have been established in the Lanarkian of Yorkshire :—

| | Goniatite Zones. | Non-Marine Lamellibranch Zones. | Plant Zones. | Major Divisions (Wray). |
|---|---|---|---|---|
| Silkstone Coal<br>Beeston Coal | Gastrioceras Zone | Ovalis Zone | Yorkian | Middle Coal Measures. |
| Crow Coal<br>Black Bed Coal<br>Better Bed Coal | | | Upper Lanarkian | |
| Elland Flags | | Lenisulcata Zone | Lower Lanarkian | Lower Coal Measures |
| Hard Bed Coal<br>Soft Bed Coal | | | | |
| Pot Clay Coal<br>Rough Rock | | | | |

Finally, I should like to thank Dr. Crookall for his continued advice and assistance, and Dr. R. G. S. Hudson for permission to examine the Bond Collection of plants at Leeds University.

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(2) Kidston, R., ' The Yorkshire Carboniferous Flora,' *Trans. Yorks. Nat. Union*, Leeds, 1890, Pt. XIV, p. 5.

(3) Wray, D. A., ' The Carboniferous Succession in the Central Pennine Area,' *Proc. Yorks. Geol. Soc.*, Vol. XX, 1929, pp. 272-285.

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(12) Jongmans, W. J., in Jaarverslag over 1929 (1930) *Geologisch Bureau voor het Nederlandsche Mijngebied te Heerlen*, pp. 77-81.
(13) Johnstone, M. A., ' Coal Measure Plant Records,' *Naturalist*, 1915, pp. 31-32.
(14) Walton, James, ' The Black Bed at Bradley Park, Huddersfield,' *Naturalist*, 1932, p. 304.

## YORKSHIRE NATURALISTS AT SEMERWATER.

(*Continued from page* 165.)

CHARLES ALLEN.

The Pisidia, mentioned in the Freshwater Biology report have been submitted to Charles Oldham, Esq., who has kindly verified the following determination of the species :—

1. Feeder streams entering the River Bain from the North-west : *P. cascertanum.*
2. River Bain : *P. amnicum* (immature).
3. Feeder streams entering Semerwater from the South-west : *P. personatum.*

## *Juncus Triglumis L.* ON CRONKLEY FELL, YORKSHIRE.

GEORGE W. TEMPERLEY.

In J. G. Baker's *North Yorkshire*, p. 389, the following statement occurs :

> ' *Juncus triglumis L. Alien.* Upon the banks of the stream upon the plateau of Cronkley Fell, this species grows sparingly, and it is said to have been planted there by John Binks.'

I have recently come across an interesting confirmation of the fact that John Binks did actually plant the specimens of this *Juncus* on Cronkley. In an old interleaved and annotated copy of *The Botanist's Guide through the Counties of Northumberland and Durham* (1805) by N. J. Winch and others, which was once the property of William Robertson of Newcastle—died about 1840—the following MS. note is his own handwriting occurs :—

> ' J. Binks brought three plants of this from Meldon Fell (where he first discovered it) and planted them by a stream near the Black Arc on Cronkley—Yorks. Two plants were in fructification when he pointed them out to me in August 1814. W.R.'

From this small beginning the plant has spread considerably. It is now to be found scattered over many patches of the wet shingle on the streamlets issuing from both the eastern and western edges of the sugar limestone plateau on Cronkley Fell.

In Robertson's Herbarium, now in the Hancock Museum, Newcastle-upon-Tyne, there are specimens of *Juncus triglumis* gathered by J. Binks on Meldon Fell in 1814.

# THE PHYSIOLOGY OF WHALES.

ROBERT W. GRAY.

THE physiology of whales is still very imperfectly understood, leaving much room for interesting speculation.

Is the submerged whale dependent or independent for its oxygen on the air in its lungs? Let us examine these alternatives, remembering that whales, as mentioned in my previous papers to *The Naturalist*, descend to great depths, and remain many minutes, perhaps hours, at a time under water. Let us see which of the two best explains the facts connected with the whale.

(1) Is the submerged whale, like the human diver, or the whale's own ancestors in the same circumstances, dependent for its oxygen on the air inhaled before leaving the surface? Does it take a very deep breath, filling its capacious and very elastic lungs with oxygen and nitrogen, and returning to the surface when the former is nearly exhausted?

Mr. Laurie in his *Discovery* Report 'Some Aspects of Respiration in Blue and Fin Whales,' and Professor Krogh, of Copenhagen, in his recent paper, the 'Physiology of Whales,' *Nature*, April 28th, adopt this view.

Whales, as is well known, usually breathe in a very vigorous manner, inhaling and exhaling a large amount of air, and both Mr. Laurie and Professor Krogh assume that this fact is directly connected with the whales' need of remaining under water many minutes at a time, and not with the fact that whales usually breath in difficult circumstances and that the function must be quickly performed.[1] They attach much importance to the whales' vital capacity (*i.e.* the amount of air inhaled). The former puts it at 3,050 litres, enough, he says, to last the whale 17 minutes; the latter in the case of a very large whale puts it at 14,000 litres, enough to last it about 50 minutes swimming at three knots and using up its oxygen at 53 litres per minute.

According to this alternative, the blood circulates through the submerged whale's lungs as in the human diver, and in the whale itself when at the surface, until if the whale descends beyond a very moderate depth and remains down long enough, all the air in the lungs, both desirable oxygen and harmful nitrogen, is absorbed, rendering the whale liable to a severe attack of diver's paralysis when it comes up.

Professor Krogh does not explain why the whale does not suffer like the human diver, from diver's paralysis, but Mr. Laurie does. He discovered nitrogen-fixing bacteria in the

[1] See my paper 'The Breathing Movements of Whales,' *Nature*, May 28th.

blood of whales and he attributes the whales' immunity from the effects of nitrogen liberation to their presence. But, firstly, as Professor Krogh points out, the bacteria would act much too slowly to be of any value to the whale; secondly, again as Professor Krogh points out, a large amountof sorely-needed oxygen would be used up in the process; and thirdly, as Mr. Laurie himself admits, when the whale returns to the surface after a deep dive its lungs would be in an airless condition, which is not in accordance with observation. The whale's breath is always most conspicuous after a long and presumably deep dive.[1]

(2) Is the submerged whale independent of the air in its lungs? In other words, does the submerged whale 'short circuit' its lungs, and depend on the oxygen stored in its blood?

This alternative explains some facts but not others. It explains:

(*a*) Why the whale is not subject to diver's paralysis.
(*b*) Why the 'ductus arteriosus' is in a patent condition.[2]
(*c*) Why whales take a number of breaths before 'sounding,' not 'one or two' as Professor Krogh says.[3]
(*d*) Why the heart is not embarrassed by the compression of the lungs due to the pressure of the water.
(*e*) Why the whale is able to use its lungs for hydrostatic as well as for respiratory purposes.[4]
(*f*) Why a whale about to 'sound' can afford to expel air from its lungs.[5]
(*g*) Why the whale escapes death from drowning at birth. An interval must elapse before the newly-born whale can breathe. During this interval, the newly-born whale must exert itself; firstly because its buoyancy,

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[1] Scoresby: *Arctic Regions*, Vol. 1, p. 465, referring to the Greenland whale, says 'They blow strongest, densest, and loudest when "running," when in a state of alarm, and when they first reappear at the surface after being a long time down.'

[2] See my 'Pulmonary Circulation of Whales,' *Nature*, 1928, and Ommaney's *Vascular Networks of Whales*, p. 300. He says: 'No mechanism (for 'short circuiting' the pulmonary circulation) was found in the Fin-Whale except that the ductus arteriosus is very wide and has a specious lumen.'

[4] See my 'Breathing Movements of Whales,' *Nature*, May 28th, 1934. Scoresby: *Arctic Regions*, Vol. 1, p. 468, says '(Greenland) whales remain at the surface to breathe about two minutes, seldom longer, during which time they "blow" eight or nine times.' Beale (*The Sperm Whale*, p. 43) says, 'at each breathing time the (sperm) whale makes from sixty to seventy expirations, and remains . . . at the surface ten to eleven minutes.'

[3] See my 'Buoyancy of Whales,' *Nature*, 1928.

[5] According to my notes I once observed a whale expelling air from its lungs when about to 'sound,' see my 'Notes on a Voyage to the Greenland Sea in 1886,' *Zoologist*, 1887, p. 123.

owing to the thinness of the blubber and the airless condition of the lungs must be negative in character and secondly it must bring it's blow-holes into a favourable position for breathing.[1]

This alternative does not explain the whale's ability to remain under water, for the oxygen stored in the blood would soon be used up. Moreover, Mr. Laurie tells us that whale's blood is not rich in hæmoglobin. He says ' The hæmoglobin content of whale's blood is low, approximately, 9 per cent., compared with 13.8 per cent. in human blood. The blood however, of the living whale has not an anæmic appearance, moreover, as any one who has seen a whale killed knows, it is very ample in amount.

The submerged whale, however, may possess a tissue other than its blood capable of storing oxygen against the time when the whale is under water and unable to breathe. In his *Discovery* Report ' On the Vascular Networks of the Fin Whale,' Mr. Ommaney says : ' Oxygen is very soluble in fats . . . the oxygen absorption of whale oil is nearly half that of ordinary blood . . . it may be imagined that some chemical mechanism exists for a more speedy transfer of oxygen from the blood to the fatty masses of the retia, which may thus act as an oxygen storage mechanism. The retia may, in fact, be capable of forming a sort of accessory lung . . . during the successive inspirations which the whale takes before sounding, the blood discharges oxygen into the fat of the retia and this oxygen is subsequently liberated into the circulation during the period of submergence.'

## A VISIT TO RAVENGLASS.

CECIL F. TOMLINSON.
(*Rector of Bolton Abbey*)

It was my good fortune to be in the neighbourhood of Ravenglass, off the coast of Cumberland, this year (1934), in the first week of June, so I seized the chance of a visit to the wonderful gullery there which I had not seen since 1893 ; on that former visit I remember the keeper showing us with great pride about half-a-dozen nests of the Sandwich Tern ; there are now five colonies of that handsome bird, and it is estimated that there are about 150 pairs in the largest colony ! Such is the result of the preservation which has been exercised on this part of the Muncaster Castle Estate.

On June 7th I set forth armed with a ' permit,' kindly granted by the Estate Office at Ravenglass, and having negotiated in a boat the strip of sea separating the expanse

[1] According to Sir Sidney Harmer, ' In newly-born Blue Whales and Fin Whales the blubber is extremely thin.' (*Proceedings of the Linnean Society*, 1929-1930, p. 104 )

of sand-dunes from the mainland, I walked over a stretch of wet sand till I reached the sand-dunes, where I was met by one of the watchers, a tall, sunburnt, young Scotsman, who acted as guide and showed me with justifiable pride some of the treasures of bird-life which he helps to guard.

We began by inspecting one of several colonies of Common Terns, which had just begun nesting on a flat stretch of grass-land between the dunes. Most of the nests we saw contained two eggs, but a few had three, and several only one. Our guide told me that there were something like 1,000 nests of the Common Tern on the Estate last year.

We then visited some dunes, on the top of which was a large colony of Sandwich Terns, surrounded on all sides by countless nests of the Black-headed Gull, containing either eggs, or young of varying ages. Some of the Terns' nests also had young a few days old, and the watcher was kept busy for a time putting rings on their legs ; the majority of eggs, however, were not yet hatched. The sight of so many of these large and graceful Terns wheeling about together was most fascinating ; the air was full of gulls also, and the noise they made baffles description !

A short walk over these sand-dunes, still studded thickly with gulls' nests, brought us to the beach ; and on the shingle, at intervals just above the high-tide mark, were occasional ' nests ' of both the Arctic and the Little Tern, containing usually two quite fresh eggs ; our guide said that they had begun breeding at least a week later than last year. The Arctic is the rarest of the Terns breeding at Ravenglass ; it is not very easy to distinguish in flight from the Common Tern, but the eggs, and the locality of the nest are very different. The watcher marked all the Arctic Tern's eggs we came across with an indelible blue pencil.

The Little Tern, which is not uncommon all along the Cumberland coast, is a beautiful little bird, snow-white, with a black cap, and its flight is most graceful ; neither the Arctic, nor the Little Tern make any attempt at a nest, but lay their eggs in a slight hollow in the shingle ; the eggs of the smaller species recall those of the night-jar, both in shape, colouring, and size.

On returning to the sand-dunes, we sat down to eat our sandwich lunch on a hillock, overlooking the colony of Common Terns, and watched them returning to their nests which they had left for a moment at our approach. While lunching, the guide noticed a lot of loose sandy soil at the entrance to a rabbit burrow, and on investigation he found two whole eggs and one broken egg-shell of a Sheld-duck ; the duck had evidently ventured to make her nest in an inhabited burrow, and the indignant rabbits had scratched them out ; we had

seen two pairs of Sheld-drake when we first approached the gullery.

The number of black-headed gulls at Ravenglass does not seem to vary much from year to year, in spite of the fact that several thousands of eggs are sold for food every year ; many of the sand-dunes are literally covered with nests, almost touching one another ; it is practically impossible to make an accurate estimate of the number, a rough calculation, made by an ornithologist a few years ago, placed the number of pairs at over a hundred thousand ! The watcher told me that he once picked up a dead gull on a nest, and found a ring on its leg showing that it had been rung twenty-two years before at Ravenglass ; I expect Messrs. Witherby have the record, but it was new to me.

The only other species of sea-bird nesting near the gullery were the oyster-catcher and the little ringed plover, both of which are common all along that coast.

It will be interesting to hear whether the Arctic Tern increases at Ravenglass as the Sandwich Tern has done ; up to now, I believe, there is no record of the Roseate Tern nesting there, though the watchers are always on the look-out for it.

I conclude this somewhat rambling account of a memorable visit, by recommending any bird-lover, who has not already been to Ravenglass, to pay it a visit himself, if ever he gets the chance.

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## REVIEWS AND BOOK NOTICES.

**A Bibliography of Gilbert White of Selborne,** by **Edward A. Martin,** pp. viii.+194. Halton and Company. Price 10/6. This is not only a very complete account of the innumerable editions of the *Natural History of Selborne.* Nearly half the book is devoted to valuable chapters on the Life and Work of White and a vivid description of the village where he spent the best years of his happy life. Mr. Martin produced a bibliography of Gilbert White over thirty years ago and is now able to amplify and bring up-to-date a most useful piece of work. The book will be indispensable to the many collectors of White's works and will be read with profit by all interested in nature. All the important editions of White are described in greatest detail and in a large number of cases there follows a long list of auction and second-hand prices over a number of years. Not the least interesting item in the book is a reproduction of two pen-and-ink sketches of White which were discovered in 1914 in White's copy of Pope's *Iliad,* now in the British Museum.

**Wisdom in the Wild,** by **Douglas Gordon,** pp. xii.+330. John Murray. Price 7s. 6d. Mr. Gordon is a lifelong Naturalist who now brings together his ideas on the ' animal mind.' The result is a most delightful book which can be recommended whole-heartedly to all Naturalists. Some of the chapter headings which give an idea of the scope of the book are : the Wild Creature's attitude towards Mankind, Affection, Relationship, Animosity, Friendship, Language, Reaction

to Emergency, Orientation and Migration, Vision, Limitations. One gets an impression of a tendency to be rather dogmatic but this is usually due to the omission of actual examples and of evidence generally. The working Naturalist will, however, find himself supplying all the instances required, as the need arises, and not a few will challenge some of Mr. Gordon's opinions. For instance, on page 148 we read : ' Avian music is taken for granted as a rule and seldom is the question raised as to the reason for bird song. The performance serves no apparent purpose and as a general rule it seems sufficiently apparent that the vocal efforts of bird or beast are inspired by much the same emotions as those which induce a boy to whistle.' We would like to know the reason for this surprising statement. Most ornithologists who have made a special study of bird-song are now inclined to associate the phenomenon with mating and the establishment of territory.

**Secrets of Nature,** by **Mary Field and Percy Smith,** pp. 248 and 90 photographic illustrations. Faber and Faber. Price 12s. 6d. The many people who have been delighted by the films called ' Secrets of Nature ' will be pleased with this charming book. In it are very completely revealed the methods of those cinematographers who have shown us plants growing from seedling to maturity in a few minutes, fascinating chapters from birdlife, the habits of animals at the Zoo, and life under water. It is all told in a most entrancing manner, and the book will surely increase the popularity of nature films. Many readers will feel strongly tempted to take up nature cinematography, but it is plain to see that the hobby at present is a very expensive one and to a large extent must be left to the professionals. Some films take years to make, and the results can be exhibited in as many minutes ! It is a pity that it is impracticable to illustrate a book like this with actual moving pictures. It can be done in a rather crude manner by printing successive ' frames ' in successive top corners of pages, the reader then slipping the pages rapidly past his finger. As it is, these ' still " pictures are excellent and really do illustrate the text.

**Electromagnetic Waves,** by **F. W. G. White, M.Sc., Ph.D.** (Methuen's *Monographs on Physical Subjects*). pp. viii.+108. London, Methuen & Co., Ltd., 1934. 3s. net. The greater part of this monograph forms a clear and carefully arranged exposition of classical electromagnetic theory. Although most of the subject matter is to be found in an honours Physics course, the honours and post-graduate student will find here a convenient and useful reference book. Some eighty pages deal with the development of electromagnetic theory for dielectrics and dispersive media and the propagation of electromagnetic waves in a dispersive medium with an applied magnetic field. Vector methods keep the mathematics as concise as possible and a summary of the operations of vector calculus are included in an appendix. The last chapter applies the results of theory to the propagation of wireless waves in the atmosphere and gives a comprehensive, although rather condensed, account of recent experimental work on this subject. More space might well have been devoted to this interesting topic ; but the extensive bibliography makes up for this and greatly adds to the value of this chapter.—F.W.S.

**The General Principles of the Quantum Theory,** by **G. Temple, Ph.D., D.Sc.** (Methuen's *Monographs on Physical Subjects*). pp. viii.+120. London, Methuen & Co., Ltd., 1934. 3s. net. The author sets forth in this book a rigorous consideration of the principles underlying the Quantum Theory. The characteristics of the ultimate elements of atomic physics are represented mathematically by linear operators—complex numbers representing operations executed upon vectors—and the

first chapter defines and explains the necessary mathematical methods. Subsequent chapters consider the laws of measurement in the domain of ' micro-physics ' and develop the quantum dynamics of the single particle and of systems composed of several particles. Numerous examples are given in the text and the book is undoubtedly useful to one specialising in mathematical Physics. It cannot, however, be regarded as a book for the reader of ' average scientific attainment ' and as such falls somewhat outside the scope originally intended for this series of monographs.—F.W.S.

**True Dramas of Wild Life,** by **George Hearn.** pp. 286 and 115 photographic illustrations, price 8s. 6d. Messrs. Hutchinson and Co. That Mr. Hearn has ventured on another illustrated book of natural history within a year of the appearance of his *Strange Happenings in Wild Life* is a significant and encouraging commentary on modern taste in books. In the book under review Mr. Hearn's pictures are as good as ever, and he has a happy, readable style of writing. While one cannot learn natural history from mere reading, a book of this kind will provide just the right kind of incentive and encouragement to its readers to go out and observe for themselves. The incidents described are mainly about birds, although this is not apparent from the title or the publishers' description.

**British Birds.** Volume XXVII (1933-34). This valuable journal is now indispensable to the serious ornithologist. In the volume just completed we can find all the important records for British ornithology made during the past year. There are many useful articles on habits, structure, etc., and not the least interesting feature of the volume is the revived discussion on Territory in Bird Life. The ' British Birds ' marking scheme makes great progress. In 1933, 38,441 birds were ringed as against 30,593 in 1932 and 29,554 in 1931. Eleven ringers (or groups) have ringed over one thousand birds each, the record being held easily by Dr. H. J. Moon, who ringed no fewer than 5,322 birds. When it is realised that only three per cent. of the ringed birds were recovered, it will be seen that there is plenty of work still to be done by those with the necessary knowledge and leisure.

**Physico-Chemical Practical Exercises,** by **William Norman Rae** and **Joseph Reilly.** pp. xiv+276 and 74 diagrams, 7s. 6d. Methuen. This volume forms a welcome addition to the somewhat restricted number of text-books dealing with practical physical chemistry. It is complete in itself, but consultation of the authors' more comprehensive work (*Physico-Chemical Methods*, Methuen) is facilitated by added references. Prominence is given to modern subjects and modern methods, whilst noteworthy features are chapters dealing with the manipulation of the slide rule, nomography, and potentiometric titration, together with the extensive employment of electrical methods for the measurement of temperature. In a book of this size, covering a wide range of subjects, some condensation is necessary, and some omissions unavoidable ; nevertheless, the cursory treatment accorded to the Pulfrich refractometer and its operation appears to exceed the limits of desirable compression, and no mention is made of the superior 60°-prism instrument now available. Apart from this deficiency, the book (especially the experimental directions) is excellent, and should prove valuable, since it satisfies a real need.—C.W.S.

**Committee on Bird Sanctuaries in Royal Parks (England) Report for 1933.** pp. 24, price 6d. H.M. Stationery Office. The Bird Sanctuaries Committee has been in existence for twelve years and its report for 1933 is very interesting reading. The Royal Parks concerned are those in and near London, and naturalists who have observed

birds in, say, Richmond Park, will not be surprised to hear that 55 species are believed to have bred in that park in 1933. This number includes the following : Reed Bunting, Tufted Duck, Great Crested Grebe, Heron, Nuthatch, Little Owl, Tree Sparrow, Stonechat, Whinchat, and the Great Spotted Woodpecker. All the Royal Parks are true bird sanctuaries, and it is very encouraging to read of the results of the protection thus afforded. London ornithologists will always have plenty of material for observation close at hand.

**A Guide to the Fossil Mammals in the British Museum (Natural History).** pp. 84+3 plates and 72 text-figures.

**A Guide to the Fossil Birds, Reptiles, and Amphibians in the British Museum (Natural History).** pp. 88+9 plates and 51 text-figures. Both sold at the British Museum (Natural History), Cromwell Road, London, S.W.7 (and through booksellers). Price 1s. each, post free 1s. 2d. Like most British Museum publications these guides are really valuable introductory textbooks in the subjects dealt with and can be read profitably by those who cannot visit the museum itself. In both volumes the text has been very completely revised and nomenclature, etc., brought up to date. Fossil birds were formerly included in the Guide to the Fossil Mammals but have now been appropriately transferred to the volume on Reptiles. Both volumes are indispensable to naturalists who wish to make a serious study of the superb collections at the Natural History Museum.

**Science Progress,** by **Edward Arnold.** Price 7s. 6d. The current (July) number of this valuable quarterly review contains articles covering a wide range. Professor Seward writes on ' An Extinct Malayan Flora in England,' and discusses in great detail the volume—the ' London Clay Flora,' by Mrs. E. M. Reid and Miss M. E. J. Chandler, recently published by the order of the Trustees of the British Museum. Mr. Philip Lake has an article on ' The Rivers of Wales and their connection with the Thames.' This is followed by an admirable account of ' Modern Seismology,' by F. J. Scrase of Kew Observatory ; ' Elements, Old and New,' by Professor James Kendall ; ' The Turbulent Motion of Fluids,' by G. F. P. Trubridge ; and ' Some Biological and Economic Aspects of the Gall Midges.' There are very full notes of recent advances in Science and nearly 50 books are reviewed.

**This Progress,** by **Bernard Ackworth,** pp. 334, 7s. 6d. Rich and Cowan, Ltd. This book is an attack upon the theory of evolution. It is for that reason stimulating and of interest, since at the present the majority of people assume the validity of the theory of evolution without having critically considered its foundations. It is safe to say that Captain Ackworth's book will throw them back to first principles. On the other hand, the book is argumentative and the arguments are often illogical and confused. It seems that the author has, on the whole, failed to distinguish between two things, the theory of evolution itself and its subsequent application to almost all branches of human thought and activity. Many people will agree with him in deploring the effects which he traces in politics and modern life and which he ascribes to the theory of evolution. But because the theory may be loosely and incorrectly applied, does not mean that it is itself ill-founded. Nor do we think that it is correct to accuse biologists of being responsible for statements concerning the evolution of morals, of law and of ethics. These are outside the scope of biology. The book itself is well planned. It commences by attempting to define evolution. It then very briefly considers the evidence for this process, and finally deals with the alternative of special creation, in which the author believes. Some chapters are interpolated dealing with bird flight and bird migration.

The relation of these to the general thesis of the book is not particularly clear, but they do show that Captain Ackworth can write well and convincingly when he is dealing with problems of which he has first hand acquaintance. Much of the rest of the book is special pleading, and although it is often very readable it must be confessed that Captain Ackworth has neither the knowledge nor the impartiality necessary to make it entirely convincing. His position is very much that of a biologist who might be prepared to criticise the design of a battleship or to argue a point of law. It is, in particular, necessary to point out that the theory of evolution is not dependent for acceptance on the doctrine of natural selection. The hypothesis of natural selection was an attempt to explain how evolution came about, and modern work has tended to substitute for natural selection either the fact of mutation or else, as hypothesis, some modified form of Lamarck's ideas. The advances in knowledge which have brought about this change have not thrown doubt on the theory of evolution itself ; rather have they tended to confirm it. Yet the author frequently uses quotations which were directed against the hypothesis of natural selection to support his statements against evolution. Furthermore, it is not logically permissible to reject the theory of evolution because the evidence is indirect or circumstantial, and then to accept the theory of special creation on much weaker circumstantial evidence alone. Indeed the validity of this evidence as quoted by the author is open to serious question. The production of a beech nut is not the special creation of a new form of life. The cells of which such a nut is made develop from those of the parent plant in the same way as every individual organism we know contains a material part of its ancestors. Further, the argument that special creation is simpler to understand is, unfortunately, not very helpful. It does not seem to have occurred to Captain Ackworth that many biologists would willingly throw over the theory of evolution on account of the complexity it introduces into some of their problems. They retain the theory as the simplest one which will adequately meet the known facts.

**Plant Chimaeras and Graft Hybrids,** by **W. Neilson Jones,** pp. 136, 21 text figures, 3s. 6d. Methuen and Co., Ltd. This is another of Messrs. Methuen's excellent monographs on biological subjects. It deals with the problems of plant chimaeras, that is to say, of plants which are genetically of mixed composition. To this group of plants belong many of horticultural as well of botanical interest and, particularly, many of the cultivated variegated forms, and also such curiosities as the graft hybrids, *Cytisus Adami* and the Bizarria orange. Professor Neilson Jones adopts and amplifies the view of these plants which regards them as representing a ' core ' of one form and a ' skin ' of another. He shows how this interpretation may be reconciled with recent information as to their morphological, cytological, and genetical peculiarities and with data obtained from stem and root cuttings. The whole makes an admirable analysis, and review of the subject, well written in simple style.

**Cellular Respiration,** by **Norman U. Meldrum,** pp. 116, 17 figures, 3s. 6d. Methuen and Co., Ltd. No subject of recent years has attracted the attention of biochemists more than the problems of respiration in cells. A large and specialised literature has consequently grown up, which it is very difficult for the average biologist to assimilate. In this posthumous book, Dr. Meldrum gives an excellent summary of the biochemical work on the mechanism of respiration in cells. The summary is, however, particularly valuable because it also analyses the data and shows how a unified conception of respiration is arising from very diverse methods of attack. The treatment reflects the greatest

credit on its author and the book may be strongly recommended to research workers, to students or to teachers who wish to obtain easily an adequate knowledge of this fundamental problem.

**Field Studies in Ecology,** by **R. Bracher,** pp. 100, 10 figures, 2s. 6d. J. W. Arrowsmith (London), Ltd. This is a simple account of field methods in plant ecology. It gives firstly, a synopsis of the main British types of plant community, and then secondly, a brief account of the methods which can be used in describing these communities. It is essentially a book for use in connection with work in the field, and it may be recommended to students, teachers, and others who may wish to institute work of this character. Its disadvantages are inherent in its form and price. There is naturally a tendency towards excessive simplification in the summary of British vegetation and it might have been advantageous to have a fuller account of growth forms and of plant succession. The instructions for field-work are, however, clear and adequate and the apparatus required is simple.

**Transactions of the Bose Research Institute, Calcutta,** vol. viii, 1932-33, pp. 266, 131 illustrations, 21s. net. Longmans. This volume contains a number of papers dealing with the movements of leaves and the effects of certain changes in external conditions upon these movements. There are also studies of the effects of external stimuli upon the growth of roots and upon the rate of increase in stem thickness, a subject which has previously been little considered. Sir J. C. Bose contributes an interesting article on the possibility of water disturbances and vegetable drugs having differential effects on certain species of Indian fish. There is also an anthropological treatment, with data, of the racial affinities of the Mundas, an aboriginal native race of the Chota Nagpur Hills. Data on the distribution of manganese in plants seem to indicate that this substance is necessary for healthy development. There are other papers of biochemical and photochemical interest. It may be noted that the leaf figures on p. 52 is certainly not that of *Vicia foba* as stated.

**The Kinetic Theory of Gases,** by **Martin Knudsen**, Professor of Physics in the University of Copenhagen. pp. vii+64, with 20 diagrams. ' Methuen's Monographs on Physical Subjects, 2s. 6d. This monograph publishes the subject matter of three lectures given by the author in the University of London. After a brief statement of the foundations of the Kinetic Theory, various phenomena associated with the flow of gases at low pressures are dealt with, including the earlier work on accommodation coefficients and the interaction of gas molecules and solid surfaces. No attempt is made at a comprehensive treatment of the subjects touched upon ; but nevertheless the reader, familiar with present-day experimental work in Physics, will find here a most interesting account of the personal researches of a leading investigator in this field or work.—F.W.S.

## NEWS FROM THE MAGAZINES.

From the Council for the Preservation of Rural England we have received a voluminous Schedule of Wild Plants requiring special protection under various Bye-laws, which includes ' common attractive plants which are to be found in varying degrees of profusion in nearly every county.' There is also a special list of other species given for each of the three Ridings of Yorkshire. Our representative on the Council (Mr. T. Sheppard) has sent the Yorkshire lists to the Secretary of the Yorkshire Naturalists' Union, Mr. Chris. Cheetham.

*The Entomologist's Record* for March contains ' Lepidoptera at Maurin, Basses-Alpes, France,' by W. P. Curtis ; ' Collecting Butterflies in

Orissa (Bihar and Orissa), India,' by W. M. Crawford ; 'Nocturni in 1933,' by A. J. Wightman ; ' Unusual Captures at Hawthorn and other blossoms,' by H. Donisthorpe (Coleoptera taken in Windsor Forest) ; ' *Trypeta* (*Orellia*) *Winthemi* Mg. : an addition to the list of British Trypetidæ,' by M. Niblett (Ranmere Common, Surrey, bred from *Carduus crispus*) ; ' Notes on Collecting,' and ' Current Notes and Short Notices,' and two supplements, ' British Noctuæ ' by H. J. Turner, and ' Butterflies of the Upper Rhone Valley,' by R. Verity.

The *Scottish Naturalist*, No. 208 (July-August, 1934), contains an article on ' The Great Skua ' by H. J. Burkill ' ; ' The Hare in North Uist,' by George Beveridge ; ' The Status of Petrels in certain remote Scottish Islands,' by Malcolm Stewart ' ; ' The Water Shrew on Pladda Island,' by Rev. J. M. McWilliam ; and ' The Rate of Growth of Balanus, by Hilary B. Moore. There are also notes and book notices.

*The Entomologist* for July contains, ' Captures of Lepidoptera, During 1933,' by S. Wakely ; ' Indo-Australian Hesperiidae ; Descriptions of New Genera, Species and Sub-species,' by Brigadier W. H. Evans ; ' A Catalogue of the Noctuae of Ireland,' by Lt.-Col. C. Donovan ; ' Notes on the Types of Three Genera proposed by Jacob Hubner in the first Volume of his Sammlung Exotische Schmetterlinge, with a Definition of a New Genus,' by F. Hemming ; ' Dragonflies in 1933,' by H. G. Attlee ; and numerous Notes and Observations.

*The Entomologist's Record* for June, contains ' Lepidoptera at Maurin, Basses-Alpes, France,' by W. P. Curtis (with eight plates) ; ' The Geometers of Storrington, W. Sussex,' by G. S. Robertson ; ' Dutch forms of Lepidoptera described in Holland,' by B. J. Lempke ; ' Some notes on British Trypetidae,' by M. Niblett (a most interesting paper) ; ' Rhopalocera in Austria,' by F. B. and A. E. Welch ; ' Nomenclature, The List,' by H. J. Turner, and supplements ; ' The British Noctuae and their Varieties,' and ' Butterflies of the Upper Rhone Valley.'

The *Entomologist's Monthly Magazine* for April contains ' British Sawflies of the genus Tenthredopsis (*Hymenoptera symphyta*) (with figures),' by R. B. Benson ; ' *Haliplus furcatus* Seidlitz in England,' by C. T. Gimingham ; ' Further remarks on some of Motschoulsky's type of Oriental Staphylinidæ (Col.) ' by M. Cameron ; ' Note on *Trogophloeus nigrita* and *T. oculatus* Woll. (Col. Staphylinidæ),' by M. Cameron ; ' Marriage (?) Flights of some Coleoptera,' by H. Donisthorpe ; ' A contribution towards a list of the Aquatic Coleoptera of North Wiltshire,' by E. J. Pearce ; ' Notes on Wasps—II, On the Adoption of an orphaned brood of *Vespa vulgaris* L. by a queen of *Vespa germanica* Fab.', by G. E. J. Nixon ; ' Additions to the British list of Collembola, with records of some rare species,' by W. M. Davies ; ' A preliminary survey of the nest fauna of Short-tailed Voles (*Microtus agrestis* and *M. hirtus*),' by D. H. S. Davis ; and a few short notes.

*The London Naturalist* for the year 1933 is full, as usual, of interesting and informative articles, and does credit to the London Natural History Society of which it is the Journal. It is impossible to particularise all the papers, but the following should be mentioned : ' Some observations on the Glow-worm,' by R. W. Pethen (an original article giving notes on the life history and numerous interesting facts) ; ' Gulls in the London area,' by E. C. Rowberry (giving records of eight species and notes on general habits) ; ' Ferns of the Home Counties,' by L. G. Payne (with three plates and records of twenty-three species) ; ' The marks used by Swan-owners of London and Middlesex,' by N. F. Ticehurst (with four plates and 135 figures of marks used, an exhaustive paper) ; ' *Andricus furunculus* (Beyer) Kieff, and its gall,' by J. Ross (the gall of the sexual form of *Andricus ostreus* Gir) ; ' Birds of the Norwood district,' by F. G. Swayne (recording 79 species) ; ' Noteworthy plants in the London area,' by R. W. Robbins (*Potentilla palustris, Claytonia alsinoides, Doronicum pardalianches, Linaria repens* and *Poa chaixii* new to the

records) ; ' Three interesting plant galls,' and ' Plant gall records for 1933,' by H. J. Burkill (with plate) ; ' Birds in the London area, 1933,' by the Ornithological Records Committee (The outstanding events were the breeding in the area of the Blue-headed Wagtail and the Black Redstart) ; ' British Butterflies in 1933,' by H. J. Burkill (*Limenitis camilla* and *Polygonia c-album* abundant in several localities in Surrey) and supplement ; ' Botanical records of the London area " (*Campanula* to *Plantago*).

In view of the interest taken in Tunny Fishing on the Yorkshire Coast, our readers may care to know that there is an article by F. S. Russell, of the Plymouth Laboratory, on Tunny Investigations made in the North Sea on the yacht *St. George* during 1933, with eight illustrations, in the *Journal of the Marine Biological Association* issued in May.

*The Entomologists' Monthly Magazine* for May contains ' A preliminary survey of the nest fauna of Short-tailed Voles (*Microtus agrestis* and *M. hirtus*),' by D. H. S. Davis ; ' An entomological tour in Sweden, August, 1933 ' (with three plates), by B. N. Chrystal ; ' Observations on British *Coccidæ*, XIV (with figures),' by E. E. Green ; ' A new British Psammocharid wasp, *Priocnemis coriaceus* Dahlbom,' by O. W. Richards (Berks., Oxon., Hereford, Surrey, Hants., Cornwall) ; ' A contribution towards a knowledge of the genus *Aeolothrips* (*Thysanoptera*) with descriptions of new species,' by R. S. Bagnall, and several short notes.

No. 112 of *Science Progress*, published on April 5th, will interest the layman almost as much as the scientific reader. Some of the articles will have a particular appeal to Naturalists. Mr. F. S. Russell, of the Marine Biological Laboratory at Plymouth, writes on that remarkable fish, the Tunney, distinguished by its red flesh, warm blood, and frequent appearance in the press. Professor L. Vegard, of Oslo, who writes on ' The Northern Lights and the Story they tell,' discusses present theories on the aurora—which is, of course, studied most intensively in Scandinavia—and gives some of his own photographs. Dr. K. C. Bailey makes an eloquent plea for fuller recognition of ' The Place of Chemistry in History.' In an article full of quaint side-lights on the history of science, Professor C. B. Fawcett writes on ' Geographical Factors in the Study of Man,' and Mr. D. M. Follett on ' Photoelectric Cells,' which have found such wide commercial applications in recent years. There are the usual extensive surveys of Recent Advances by experts in many branches of science ; an Essay-Review of Darwin's ' Voyages of the Beagle,' by Professor James Ritchie, and critical notices of some forty books. No. 112 completes the first volume since the review was taken over by Messrs. Edward Arnold. The very full Index included in it represents a really valuable improvement. There is a separate Index of reviews.

## NORTHERN NEWS.

Mr. C. H. Wilson, of the Museum, Scarborough, is endeavouring to compile a list of the objects of Prehistoric date found in the area from Flamborough Head *via* Grindale, to Weaverthorpe on the south ; thence to Knapton, Thornton Dale, Eller Beck Bridge, Lilla Howe to Ravenscar and the area that lies between. Those in the Scarborough Museum have already been illustrated and described by the present writer in *The Naturalist* for 1921. The following additional items are in the Mortimer Museum at Hull :—Bilsdale, 1 palstave ; Bridlington, 2 palstaves ; Brompton, 1 palstave ; Esk, 1 socketed axe ; Ferndale, 1 palstave ; Gransmoor, 2 palstaves ; Hunmanby, 2 palstaves ; Lowthorpe, 2 socketed axes ; Rudston, 1 socketed axe, 1 sword section ; Sherburn, 1 dagger ; Thornton Dale, 1 socketed axe ; Wetwang, 1 dagger. Besides these, there are, of course, a large number of objects described by J. R. Mortimer in his ' Forty Years' Researches in British and Anglo-Saxon Burial Mounds,' which are also now in Hull.—T. Sheppard, Hull.

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SEP 18 1934

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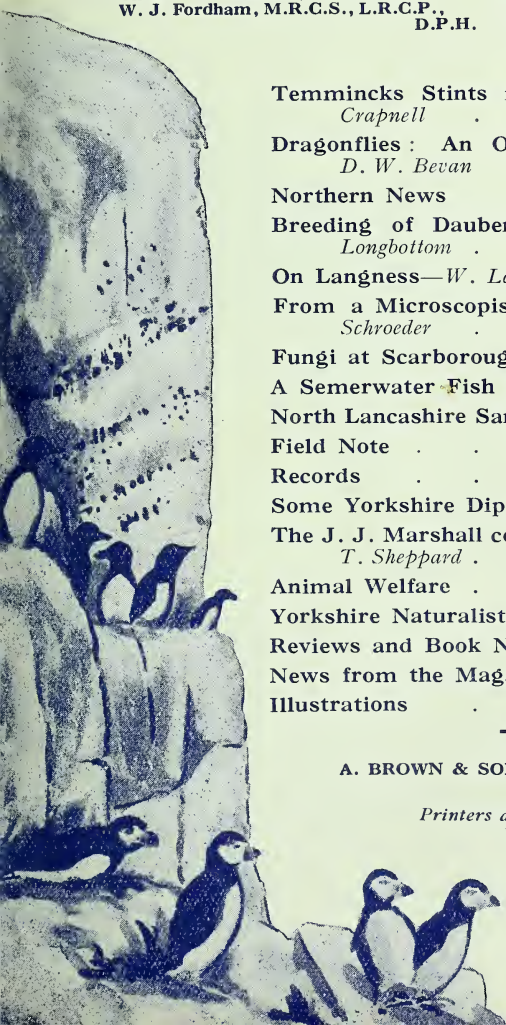

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# TEMMINCKS STINTS NESTING IN SCOTLAND.

V. S. CRAPNELL.

Two Yorkshire Naturalists, Messrs. G. R. Edwards and V. S. Crapnell, of Halifax, discovered a pair of Temmincks Stints breeding in Central Scotland, this June. The nest was on a loch side, and the clutch of four eggs, together with notes on the adult birds, were forwarded to South Kensington for expert opinion. It is very gratifying to know that the authorities there have proclaimed them to belong to the species named above. The circumstances relating to this important record, the first of its kind to be reported in the British Isles, are related below.

Both observers, who were spending a holiday in the locality, mainly for bird photography, passed close to the nest several times on their way to and from the breeding site of a Common Sandpiper. Nothing unusual, however, was noticed until one morning Mr. Edwards flushed the bird from her eggs on his return from seeing the writer into a hide tent erected at the Sandpiper's nest. On previous occasions we must have practically trodden on the bird as we made our way round the loch, but up to this occasion she gave no sign of her presence. Unfortunately Mr. Edwards had little chance of identifying the stranger as its swift erratic snipe-like flight soon carried it out of sight across the water. The nest, what little there was of it, lay a few feet from the water's edge, in short vegetation, with a small patch of a common kind of dwarf rush at one side.

The spot was typical of the usual loch side to be found in this locality, a narrow stretch of beach consisting of stone and shingle leading up to slightly higher ground covered with grass and other short vegetation. This in turn was surmounted by slopes of pine trees and heather and other thick growth. The loch is solitude itself and the figure of man rarely appears to disturb the peace. The birds had indeed chosen a picturesque and isolated spot in which to rear a family. Would that their efforts had been more successful. Closer examination of the nest and eggs revealed a certain resemblance to a Dunlin's, particularly the greenish tinge of the pear-shaped clutch. There was no lining of any kind, and the only sign of a nest when the eggs were picked up for inspection, was a small depression in the ground, and four discoloured marks on the bed of the nest where the eggs had lain. A closer watch was kept by both observers for some days afterwards, but the bird did not return to brood. Shortly after she left her eggs for the last time, a heavy thunderstorm, with lightning and torrential rain, broke over the locality, and this may have been the cause for desertion. Needless to say, the nest and its immediate surroundings were not disturbed in



SEP 18 1934

any way, and no attempt made at photography, except to expose a short length of cinematograph film on the nest and eggs. The nesting site was also avoided as much as possible, and in short, every opportunity given the bird to return, but with no avail. As the eggs were stone cold at the end of three or four days, it was considered advisable to take and submit them to more authoritative inspection, and as mentioned previously, Mr. Edwards sent them to South Kensington together with details of the nest, and notes on the adult birds, afterwards observed by both recorders. During the rest of our stay, the pair of stints continued to haunt the loch, and a stretch of seashore-like sand and shingle at one end seemed especially favoured. It was here that I watched one of the birds, presumably the male, display before its mate upon the ground. The male bird rose on extended wings, hovering in the air, perhaps twenty or thirty feet up, rising and falling with a curious, yet pleasant, trilling call. It sounded very delightful and much in harmony with the beautiful sheet of water, surrounded by high hills and slopes of pine and heather. I spent the best part of an afternoon tracking the stints, and when I finally did get them at rest in a reasonable situation for observation, I was only able to gather a few particulars, due largely to the unsettling presence of a very shy Redshank, which finally startled them into their aerial excursions once more. Deciding that my best plan would be to wait, I sat down at the water's edge, and enjoyed the varied life going on around me. Fully an hour and a half was spent in this way, before the stints re-appeared, flying fast and fairly high towards their favourite resting place of sand and shingle, at the end of the loch. I proceeded very cautiously around the water's edge, hoping for a closer view, but was still some distance away when Mr. Edwards, who had been doing photographic work higher up the valley, emerged from the pines close to where the two stints had settled. I signalled him to be careful, but fortunately he had seen the birds, and after cautious approach, got fairly near, and was able to obtain a decent view. Notes were afterwards compared, and we left convinced, especially from the courtship display observed, that breeding would be attempted again, we hoped in the same locality. We were impressed by their resemblance to a small sandpiper, of which there were many of the common variety for comparison around the loch. I may add in passing that Mr. Edwards and myself were both equipped with binoculars, and as the light was good on each occasion observations were made, we had no reason to doubt the accuracy of the following notes on the adult birds :—

Bill : dark, about 1½ inches long.

Breast : White, fawn upper plumage, with slight rust

on lower back, and four black or dark coloured spots on either side of back.

Legs: Dark, and rather on the short side.

Call: Trilling.

Flight: Swift and erratic, much after the style of a snipe.

Display: Particulars given earlier in this article.

Another visit to Scotland was paid a short time after the above observations were made, by Mr. Ralph Chislett of Rotherham, and Mr. Edwards. A journey of several hundreds of miles by road was made during a long week-end, but unfortunately without success. In spite of long and patient searching the stints were not seen again. There is some consolation, however, in the possibility that the elusive waders transferred their interest to another loch, perhaps not far off. If so, let us wish them better luck at the next attempt, and trust for a return next year of Temmincks Stints as a breeding species.

## DRAGONFLIES: AN OBSERVATION AND A QUERY.

A few days ago two observers watched by a moorland beck draining into the Jugger Howe Beck, a remarkable, and, to me, a new phenomenon. We had been watching a large female dragonfly (Mr. G. B. Walsh says probably *Corduligaster annulatus*) laying her eggs by dipping the apex of the abdomen into the quick-running stream; then she flew off, shedding as she flew a stream of eggs from a height up to some 3 ft. Suddenly, another member of the same species—there were several about—flew to a small pool, a back-water of the beck, quite close to us, and began to execute an extraordinary dance on its 'tail,' the body being in a vertical position, and the four wings in a vertical plane. The 'tail' touched the water about three times per second. This was carried on for some time, when with a rush too quick to follow, a third individual appeared, seized the dancer and flew off with it. Imagining the dancer to be a female, I searched the pool, but found no eggs. Nor did the standard books give any help.

Tillyard (*Biology of Dragonflies*) mentions (p. 325) a species the male of which has white tibiae which it 'displays while dancing in the air.' (Very human if one changes the sex!)

Lucas (*British Dragonflies*) deals with the singular habit of many species in which the male clasps the neck of the female with its anal claspers and adopts a perfectly vertical position while she lays her eggs on aquatic plants. Then he refers to exceptions, and mentions (p. 14) a case where the male released his mate during oviposition, and 'poised itself on the wing with its body in a vertical position.'

Query:—Was the dance we witnessed an invitation on the part of a male, comparable to the evening performance of the male of the ghost moth? I seek information.—D. W. Bevan, Scarbrough.

## NORTHERN NEWS.

Dr. Marshall, of the United States Geological Survey, describes some new genera and species of fossils from the Azogues Sandstone of Ecuador, sent to him by Dr. George Sheppard, the State Geologist. Among them he describes *Sheppardiconcha bibliara*.

## BREEDING OF DAUBENTON'S BAT.

M. LONGBOTTOM.

To the Bat population of Beckfoot Dam, Bingley, recorded in a previous note (see p. 174 *ante*) may be added another species, Daubenton's Bat (*Myotis daubentonii*, Kuhl). This specimen was shot by Mr. A. W. A. Swaine, of Cottingley, while it was flying close to the surface of the water on June 9th, 1934. It proved to be a female carrying a newly-born young one clinging to its breast. They dropped into the water after being shot, the adult bat falling dorsal side downwards, and

**Daubenton's Bat with new-born young, June 9th, 1934.**

the young bat, which had been killed by a single pellet, retained its grip upon its parent's body.

The accompanying photograph shows their relative sizes. The baby bat, according to Mr. Swaine's description ' was naked except for some scanty white down on the back (this disappeared during preservation) and pinkish in colour due to the blood showing through the thin skin.' As the young bat was obviously only a day or two old, it is interesting to have a record of the exact time of their breeding.

Mr. H. B. Booth has kindly examined the specimens and agrees with the identification, and they have been added to the museum collection at the Cartwright Hall, Bradford.

[The date of birth is a valuable record. Although Daubenton's Bat is probably the most common species in Upper Wharfedale (where no bat is really common), say between Burley and Burnsall, this is the first one I have actually examined from Airedale, were it is certainly not common.—H.B.B.]

## ON LANGNESS.

Across the dark-blue waters of the Bay,
The waves are dashing white
On Scarlett Stack.
Here on the Langness shore
Hardly a ripple is seen,
Where the soft-moving water meets rock.
Profound is the silence,
Felt in the heart,
Capturing the mind,
Subduing the soul ;
Little gentle puffs of wind
Pass by :
And the birds wing their quiet flight,
Uttering no sound ;
Only the buzz of a bee
In its search for heather-sweet honey,
Breaks on the ear ;
The earth is asleep ;
And the sky lightly veiled
With greyish-blue mist,
Is as a dome
Shutting out all intruders
On earth's deep lovely peace.
Away on the edge of the Ness
Wanders a boy ;
With footfall unheard,
He seems as but part of the dream
That belongs to this moment of quiet ;
Yet the silence is full of sweet music,
And in the soul
Move harmonies of joy and aspiration,
Of love and longing, of service,
And the sacrifice that, at the end,
Brings deep abiding peace.

W. Lawrence Schroeder.

---

## FROM A MICROSCOPIST'S NOTE-BOOK.

W. LAWRENCE SCHROEDER.

Some little time ago, I had the well-known slipper animalculum—*Paramoecium caudatum*—under the microscope. The creature seems to have control of sets of cilia ; the posterior cilia—rather longer and stiffer than the rest, are apparently used for steering. The oral cilia are continually in motion ; the anterior cilia are often quiet. The current directed into the buccal groove is strong enough to make it difficult for Euglenæ to get clear. Taking one of the Paramoecia, the body cilia were about ten $\mu$ long ; the posterior cilia

were sixteen $\mu$ long ; the entire length of the creature was one hundred and eighty $\mu$ ; at the widest part, it was fifty-four $\mu$.

There were twenty-two food vacuoles, which moved slowly up one side and down the other. Even those empty of food particles moved with the rest ; there was a general circulation of body material. The contractile vacuole acted at intervals of approximately twenty-five seconds ; the six radiating slits are seen only when the vacuole is closed ; nothing of the slits can be discerned when the opening is clearly seen. The expulsion of the excreta is just below the mouth.

On a day in April, I put a female Cyclops with well-developed egg-bags into a live-cell. The red-eye of the young Cyclops in the eggs could be seen quite distinctly. Two days later, not only had the young Cyclops emerged and were flitting about, but the mother had two new egg-sacs in a fairly advanced condition. The empty bags of the just emerged family were on the slide.

I was fortunate one day in late June to see the fashioning of a Leech cocoon. Five or six weeks before, a number of cocoons had been laid on the side of the jar, and several had hatched out. At 11-40 a.m. (summer time), I saw a leech, *Nephelis vulgaris*, with a somewhat strangulated appearance, indicative of the formation of a cocoon, about a third of the creature's length, from the anterior end. I watched the creature slipping out of the cocoon ; it took about two minutes to settle the case on the side of the jar. The leech shaped the cocoon with its mouth ; the material of the case seemed to be very elastic, and the shaping took two and a half minutes. The minute eggs, six in number, were laid just as the cocoon was slipped off ; they moved about with the motion of the leech as the animal busied itself with sealing the cocoon round the edges to the side of the glass jar. The cocoon was transparent, of a dull whitish colour which deepened into a yellowish brown as the hours went by. It was $\frac{5}{32}$ inch long, and nearly $\frac{1}{8}$ inch wide ; in shape a perfect oval, with nodules at each end. For ten minutes after the cocoon was fixed, the leech remained alongside ; then for another four minutes it moved about the cocoon, before leaving it altogether.

During the afternoon, the leech laid another cocoon near the first one, with four eggs in it. By ten o'clock in the evening, both cocoons were yellowing ; twenty-four hours later they were brownish, with the end nodules darker than the case.

Other cocoons showed as many as eight and nine eggs.

For four days, the increase in the size of the eggs was inappreciable. Then began a differentiation. In *a*, the six egg cocoon, two were no bigger than when laid, three were appreciably bigger, and one was a fair size. In *b*, the four egg case, one of the eggs was much larger than the rest. On

June 30th, nine days after the laying, *a* had five developed eggs, and *b* one. The increase of size was marked. On July 2nd, the five eggs of *a* filled half the cocoon, they began to show the shape of a leech, as did the one egg of *b*. The following day, they were about $\frac{1}{10}$ inch long. By July 19th, three creatures of *a* case and one of *b* case had emerged; two of the *a* case were still in the cocoon on July 23rd.

The conically shaped nodules of the cocoons disappear a little time before the leeches emerge, probably they are eaten by the young creatures. Apparently egress is at either end, the young leeches nose their way round the inside of the cocoon, before they venture into the outer world.

A number of cocoons were laid after the two on June 21st ; one became infected with fungoid growth and presently was one mass of hyphae ; the eggs had not developed. Another with ten eggs succeeded in the full development of the lot. In one of the cases, which held a single leech, the eight eyes were clearly seen, before the creature emerged.

## FUNGI AT SCARBOROUGH.

A. E. PECK,
(*Scarborough*).

On August 7th a fine specimen of the Giant Puff Ball *Lycoperdon giganteum* was found growing in the allotment garden of Mr. W. Dobson at Northstead. Two local naturalists exhibited it at the local newspaper office and it was then placed on exhibition at the Scarborough Museum. I measured it as follows :—Height 13 ins., width 20 ins., depth 16 ins., greatest circumference 60 ins. In the Yorkshire Fungus Flora there is a record, Helmsley, one 7 lbs in weight, 44 ins. in circumference ; later same season (1900) one scaling $10\frac{1}{4}$ lbs.

Swanton says ' The largest known specimen is recorded from America. It was 5ft. 4ins. in its greatest diameter, but only $9\frac{1}{2}$ ins. high. There is a record in the *Gardeners' Chronicle*, 1884, of an English specimen 5 ft. 4 ins. in circumference.' The largest specimen which I have met with personally in this district had a circumference of 33 ins. My specimens, however, are put to good table use, whereas the great majority are mischievously kicked to pieces.

In May, Miss Bettine Welburn, a Member of the Scarborough Field Naturalists' Society, exhibited at the Museum a number of Morels (*Morchella esculenta*), several specimens of *Mitrophora gigas*, and one of *Verpa digitaliformis*, all from Forge Valley. (For my notes on and photo of *M. gigas* see *The Naturalist*, July, 1920.) Massee recorded *V. digitaliformis* at Forge Valley many years ago, but although I have made many searches there, I was never successful. County records are few and I have never previously seen it in the flesh.

## A SEMERWATER FISH PROBLEM.

CHRIS. A. CHEETHAM.

Towards the end of June a great many fish were found dead on the shore of Lake Semerwater and various stories were found in the local press.

As Semerwater came into our excursion programme this year one's interest was aroused and a visit was made in mid-July. This was much too late to get evidence of the food that had been eaten by the fish, for the remains were empty skins; we heard of various animals eating them and at this late date we counted at least half a dozen to the yard at the foot of the lake. Mr. Outhwaite, Junior, of Carr end and Askrigg, gave us some interesting facts, first, that the catastrophe was confined to the Rudd or Redeye, *Leuciscus erythrophthalmus* L. and that the Bream, *Abramis brama* L. or the Trout, *Salmo fario* L. were not affected, he also pointed out that the Trout go up the feeders of the lake to spawn, the Bream remain in the lake and the Rudd, which spawn earliest, go down the River Bain, the outlet of the lake. The trouble arose after the Rudd had returned from their spawning ground, and it appears that they either got some wrong type of food there or soon after they returned to the lake. Many possibilities suggest themselves; we well remember the floods which brought the lake far out on the surrounding area at Whitsuntide; it may have carried back unusual food supplies though this was previous to the spawning time and unlikely to be the case. The next week or two were cool but fairly dry and some very hot dry weather started about June 9th, and continued to the time of the trouble.

The River Bain appeared to have a deal of algal matter on its bed and the *Myriophyllum*, *Potamogeton*, etc., were much covered with detrital matter when seen in July. The hot weather may have developed the green algae on the Rudd spawning ground to a much greater extent than is usual, and the wide spread flood waters may have brought in unusual amounts of detritus accumulated on the shore in the dry time preceding Whitsuntide.

Mr. S. H. Smith, F.Z.S., J.P., informs me that when the Yorkshire Fishery Board netted the lake some of the Bream caught were up to seventeen inches long and three to four pounds in weight, whilst the Trout were thin and emaciated; large numbers of Crayfish were taken and it appeared as if these levied heavy toll on the food supply of the Trout, but the Bream and Rudd being vegetarians find plenty of food in the water-growing reeds and plants.

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In *The Lincolnshire Magazine* for May-June, A. E. Musgrave has an illustrated article on 'The Butterflies of Lincolnshire.'

# NORTH LANCASHIRE SAND DUNES.

W. H. PEARSALL.

THE sand dunes found at various points around the English coast show many features in common, and their general features have been fully described in *Types of British Vegetation* (A. G. Tansley). The extensive dune system at Southport is particularly well known and has been rather fully studied. The sand dunes on Walney Island and to the north, on either side of the Duddon estuary, show both certain points in common with the Southport dunes and also certain distinct differences, as well as some characteristic and localised species. The dunes at the north end of Walney island are particularly distinct, and their differences are the more striking as dunes belonging more closely to the Southport type lie a quarter of a mile away at Sandscale, on the north side of the channel separating Walney Island from the mainland. There are additional dune systems at the south of Walney Island. These serve as a gullery and are in a ragged and much modified condition. Their vegetation requires further study. The dunes at Haverigg Point, north of the Duddon estuary, appear to be newer and less fully developed.

Walney Island itself and the adjacent shore is composed of boulder clay. This has been, and is being, eroded on the seaward side into shingle beach. The sand dunes are formed only at the northern and southern extremities of the island. At the north end, the northernmost dunes appear to be most recent, but their further extension northwards would seem at present to be stopped by the tidal scour through the channel separating the island from the mainland. The opposite side of this channel is a fairly stable shingle bank which extends northwards towards the Duddon estuary and there dies out. The Sandscale dunes lie inside and to the north of this bank. In general, it may be said that the dunes originate above a shingle beach and progress inwards, the oldest towards the inside until, finally, some distance from the beach little or no sand occurs above the underlying boulder clay. The dunes are highest and steepest near the sea. As they become covered by vegetation their outlines tend to become lower and more rounded.

In describing the vegetation of this area, it has been found instructive to take a number (at least ten) of one square metre quadrats in each zone and to record the species present in each. On comparing the results, some species, called *constant species*, are found to be present in at least 90 per cent. of the quadrats. Other species are more sporadic and occur in only a limited number of the random quadrats. They may be said to have various degrees of "constancy" depending

on the percentage of quadrats in which they are found. On this basis, the widely distributed species referred to subsequently have a constancy of more than 30 per cent., that is, they occur in more than 30 per cent. of the quadrats. Almost all the sand dune species are found on these dunes—but, curiously enough, the more striking dune species often play a rather small part in the quadrat lists, and tend to be widely scattered throughout the different zones.

The shingle beach is usually devoid of vegetation except at the uppermost more sandy edges. There are found scattered plants of *Salsola Kali*, *Atriplex prostrata*, *Crambe maritima*, *Polygonum Raii*, *Rumex crispus*, *Cakile maritima*, *Glaucium luteum*, *Eryngium maritimum*, *Mertensia maritima*, *Arenaria peploides* and *Agropyron junceum*. The two last, in particular, tend to spread and to accumulate sand. They are then joined by *Elymus arenarius*, and a line of small fore dunes originates from which the larger dunes develop. These, in their earliest form, support little except Marram grass, *Ammophila*, and their surface is continually shifting. As it becomes more stable an open dune association develops.

In this community *Festuca rubra* var. *arenaria*, *Phleum arenarium*, *Taraxacum erythrospermum* and *Viola Pesneaui* are constantly present in addition to *Ammophila*. Other widely distributed but not constant species are *Carex arenaria*, *Viola canina*, *Senecio Jacobea*, *Euphorbia Paralias*, *Sedum acre*, and *Tortula* sp.

At a somewhat later stage a number of species tend to form local carpets among the *Ammophila*, with *Festuca rubra* var. *arenaria*, *Lotus corniculatus*, and *Galium verum* as constant associates. The locally abundant species include *Galium verum*, *Geranium sanguineum*,* *Thalictrum dunense* Dum.,* *Rosa spinosissima* (*rubella*), *Ononis repens*, and *Convolvulus Soldanella* ; those asterisked being confined to Walney. The dunes at this stage are stable and this type of *fixed* dune association is very characteristic of Walney Island. On the mainland *Salix repens* becomes very abundant.

Behind these fixed dunes there is a zone of more rounded and lower ones, which are almost completely covered by grassland. This dune grassland has *Festuca rubra* as its most abundant constituent. Also constantly present are *Anthoxanthum odoratum* (locally abundant), *Aira praecox*, *Luzula campestris*, *Carex arenaria*, *Polygala serpyllacea*, and *Potentilla erecta*. *Salix repens* is locally abundant in the hollows. A number of other widely distributed species include *Holcus lanatus*, *Viola canina*, *Campanula rotundifolia*, *Galium saxatile*, *Dicranum scoparium*, *Polytrichum juniperinum* and *Bracythecium purum*. *Ammophila* is now local.

On Walney, at points furthest from the sea, the dune

grassland is gradually passing into heath, although the process is not complete. The constant associates of *Festuca rubra* now are *Agrostis vulgaris*, *Carex arenaria*, *Aira praecox*, *Polytrichum juniperinum*, *Rumex acetosella*, and either *Erica cinerea* or *Calluna vulgaris*. More local, but still frequent, are *Triodia decumbens*, *Sedum anglicum*, *Dicranum scoparium*, and, in the hollows, *Nardus stricta* and *Juncus squarrosus*.

The five main zones in the dunes may be distinguished as parts of an age series : (1) fore dune ; (2) open dune association ; (3) fixed dune association ; (4) dune grassland ; (5) heathy grassland, of which the last is the oldest. The main changes in soil conditions during this sequence are those connected with stabilisation of the soil, with accumulation of organic matter and with the leaching of salts away from the porous surface soil. These changes have been studied in some detail by Salisbury at Blakeney (*Ann. Bot.* xxxvi, 391). They result in this case in a progressive increase in soil acidity, such has also been demonstrated by Salisbury at Southport. In the present case the fore dune sand has a pH value of about 7·5. That of the open dune association is between pH 7 and 7·5, and of the fixed dunes between pH 6 and 6·5. The soil of the dune grassland has a pH of between 4·8 and 5·5, while the heathy grassland soil ranges as low as pH 4·2 at the surface and is about 4·6 to 4·8 at a depth of three inches. Tests with alcoholic ammonium thiocyanate showed that there was no deficiency of bases up to the fixed dune stage. The dune grassland soil normally showed a slight deficiency and a very marked reaction was obtained from soil from heathy grassland.

The sequence of vegetation so far described and the development of highly acid soils is extremely well developed on the north of Walney Island. On the adjacent mainland dunes at Sandscale, dune grassland and the extreme development of soil acidity are much less clearly shown. Here the older dunes become nearly completely covered by *Salix repens*. Underlying the sandhills here, there is a layer of clay, according to miners boring for iron ore. While it is not clear whether this is estuarine silt or boulder clay, or both, its results are certainly very evident in the much damper condition of the larger hollows or " slacks " among the dunes. Damp slacks of this type appear to be absent on North Walney, where the dune hollows often show signs of shingle. The much drier conditions on the Walney dunes would be explained if this dune system were developed over a series of successive shingle beaches laid down towards the north and north-west. The water table is undoubtedly higher at Sandscale, and under these conditions a carpet of *Salix repens*

establishes itself in the slacks, tends to develop over the fixed dunes and largely replaces dune grassland.

The conditions involved in slack formation are not very clear. The larger slacks at Sandscale usually run nearly parallel to the line of prevalent winds and roughly at right-angles to the general lines of dunes. One of the largest slacks originated in a breach caused by the conjunction of high tides and westerly gales. This was subsequently extended by wind erosion. The smaller slacks are normally the troughs of the sand waves, these take much longer to fix and are slower in developing special types of vegetation.

The larger slacks may show all stages from bare sand to a continuous carpet of *Salix repens* or, occasionally, *Potentilla anserina*. The earliest vegetation varies greatly from place to place. There are, apparently, no constant species even when plants are numerous, though *Carex arenaria* or *Centaurium umbellatum* may occur in about 40 per cent. of the quadrats. Frequent species, in addition, are *Juncus articulatus* var. *littoralis* Buch., *Carex Oederi*, *Potentilla anserina*, *Orchis purpurella*, *O. Fuchsii*, *Samolus Valerandi*, *Epipactis palustris*, and *Listera ovata*. At a later stage, usually when *Salix repens* has appeared, *Equisetum variegatum* may be locally abundant, and *Parnassia palustris*, *Galium verum*, *Funaria hygrometrica*, and *Bryum* spp. are also frequent. *Gentiana Amarella* is also characteristic of this phase, though local. By the time *Salix repens* has become dominant, sand has collected among it and low dunes are formed. These develop a drier and more acid facies of the general vegetation in which *Festuca rubra* var. *arenaria*, *Carlina vulgaris*, *Carex arenaria*, and *Tortula* sp. are present in more than 70 per cent. of the quadrats. *Pyrola minor* and *Rhacomitrium lanuginosum* are locally abundant. So far as it is at present possible to judge, this type of community corresponds roughly in age and in completeness of plant covering with the dune grassland on North Walney. It is, however, developed on much less acid soil (about pH 6) the lowest pH value recorded being 5·4. Possibly the height of the water table and the protection from leaching given by the *Salix* may account for this difference. The general resemblance of the Sandscale dunes to those at Southport is distinctly striking, the principal difference, perhaps, being the relatively greater extent of *Salix repens* at Sandscale. The contrast between the Walney dunes and those at Sandscale is equally marked. On Walney *Salix repens* is scarce, and instead *Festuca rubra* var. *arenaria* passes from a constant to a dominant species. That the difference is mainly due to the drainage conditions can hardly be doubted, for there are definite patches of dune grassland developed at Sandscale, mainly on sand overlying the shingle

bank at the south-eastern end of the dunes. It is unfortunate that the final stages of these dune successions are not yet evident. There are indications that the *Salix repens* type of succession might develop into woodland, the trees starting from the damper parts of the community. The influence of rabbits upon the course of the two successions is also a problem which might well yield interesting results. A superficial impression is that these animals are equally abundant in both types of dune and have little or no effect upon the final results.

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## FIELD NOTE.

**Cumberland Parasitic Hymenoptera.**—The following Ichneumonidæ, taken at various times in Cumberland, are worth putting on permanent record, as many have been through the hands of Mr. C. Morley, and some are uncommon. ICHNEUMONINÆ.—*Cratichneumon rufifrons* Gr., Easton, near Longtown, 25.6.29. *Phæogenes melanogonus* Gmel., Todhills, 21.9.28. *Dicælotus rufilimbatus* Gr., Todhills, 4.10.29. *Piorhinus pallidipalpis* Wesm., Todhills, 15.10.28. CRYPTINÆ. —*Cratocryptus stomaticus* Gr., Kelsick, 17.4.24. Morley says it occurs in June and July. *Microcryptus arrogans* Gr., near Longtown, 17.5.27, a ♀. *M. nigrocinctus* Gr., Kelsick, 13.9.24 ; Aldoth, 22.1.25. The Aldoth specimen was taken from wet moss. *Phygadeuon dumetorum* Gr., Kelsick, 2.6.24 and 3.6.25, a common species. *Orthopelma luteolator* Gr., Kelsick bred (sometimes in numbers) from Rose galls (*R. rosæ*) in June. *Hemiteles necator* Gr., from flood refuse from the River Esk near Mossband, 5.2.29 ; another common species. *Cecidonomus inimicus* Gr., Kelsick, 15.5.24. *Pezomachus zonatus* Först, Blackford, 2.8.28. *P. cautus* Först., Orton, 23.9.22. *P. anthracinus* Först., Blackford, 2.8.28 ; Orton, 12.8.21. *P. intermedius* Först., Orton, 12.2.16 and 17.9.21. *P. fraudulentus* Först., Kelsick, 9.9.23. *P. impotens* Först., Prior Rigg, 7.8.20, and Dalston, 7.10.22. *P. ochraceus* Först., Orton, 24.9.21 ; Todhills, 21.9.28. *P. carnifex* Först., Orton, 11.8.22 ; Aikshaw, 26.9.24. *P. corruptor* Först., Todhills, 15.10.28. *P. instabilis* Först., Orton, 13.8.21 ; Dalston, 7.10.22. *P. fasciatus* Fab., Dalston, 7.10.22 ; Aikshaw, 26.9.24. These species of *Pezomachus* were mostly taken in the sweep net while working for Coleoptera, etc. *Stilpnus gagates* Gr., a ♂ swept at Todhills, 21.9.28 ; a fairly common insect. *Spilocryptus abbreviator* var. *hopei* Gr., swept in a lane at Kelsick, 20.9.24.—JAS. MURRAY, Gretna.

*1934 Sept. 1*

## RECORDS.

### BIRD NOTES FROM SCARBOROUGH.

On April 22nd a small seagull was picked up on the shore north of Scarborough in an exhausted condition. It bore on its leg a ring inscribed, Museum, Goteborg, Sweden, 17617D. The ring was removed, the bird being set free.

Professor Jagerskiold, of the Natural History Museum at Gothenburg, informs me that this bird was a Common Gull (*Larus canus*), and that it was ringed at the breeding ground Kvarnskar, Vendelsofjorden, Halland, Sweden, about 46 km. south of Gothenburg, on June 14th, 1933.

This year, for the first time within my knowledge, about a dozen pairs of Herring Gulls have nested in the Castle cliff, above the Marine Drive, at Scarborough. On June 16th I could see, with the glasses, unfledged young ones standing in the nests.

The species nests commonly in the cliffs both north and south of the town.—W. J. CLARKE.

### WHITE-SIDED DOLPHIN NEAR SCARBOROUGH.

On July 11th I saw lying on the deck of the S.D. *Dick Whittington* a small dolphin which at first puzzled me. It measured 47 in. in length, and was black above and white beneath, the flippers being all black above and below. The beak was all black and very short. There was a narrow circle of black surrounding the eye. The specimen was a very young one and had not yet cut its teeth, which could, however, be felt as hard lumps beneath the gums—there appeared to be about 25 or 30 of them in each jaw. There was only a very faint indication of the white patch which should show on the sides.

After careful examination I concluded it was a young White-sided Dolphin, and after reading my description of it, Mr. F. C. Fraser, B.Sc., of the British Museum (Natural History), agrees with me.

The specimen was caught the same morning 27 miles N.E. off Scarborough out of a herd of about fifty individuals. The fishermen called it a Scoutler.—W. J. CLARKE.

' Two small Canadian land birds, a Chipping Sparrow and a White-crowned Sparrow, accompanied us the whole of the way across the Atlantic to Ireland, feeding on the hay and oats that we fed to the cattle. I suppose that now they are doing well in Ireland. And I suppose that every year quite a large number of American birds must be introduced into England like that. It's rather interesting as explaining in one way the occurrence of American birds on your side.'

My friend, Mr. J. A. Stevenson, late of Scarborough,

now at the Atlantic Biological Station, St. Andrews, New Brunswick, Canada, crossed the Atlantic recently in a cattle boat on a visit to England, and has given me the foregoing note, which is, I think, of interest as helping to explain one aspect of the occurrence of American birds in this country, which are usually attributed to escapes from confinement.—W. J. CLARKE.

TWAITE SHADS AT SCARBOROUGH.

Two examples of the Twaite Shad have occurred near Scarborough recently. One was exposed for sale on the local fish market on August 2nd, and measured 21 in. in length, the largest example of this species I have seen. On August 4th another example was caught by an angler fishing from the East Pier, it was $13\frac{3}{4}$ in. in length. This fish occurred more frequently than usual during the earlier part of the year, and I have notes of sixteen caught off Scarborough in the trawl nets during January and February of this year, as well as three Allis Shads. Usually both species are of rare occurrence here.—W. J. CLARKE.

LYCÆNA ASTRARCHE VAR. ARTAXERXES IN DOVEDALE.

As implied by its popular name of ' the Scotch White-spot,' the *artaxerxes* form of the Brown Argus butterfly is regarded as a Northern type. It was, therefore, with interest that I caught a fine example in Dovedale on July 29th of this year. The conspicuous white discal spot on the forewings and the white blotches on the under surface were present in characteristic form.

Close to where I caught the butterfly was a luxuriant growth of the Mountain Currant (*Ribes alpinum*). The proximity of these two forms raises the speculation as to whether the deep gorge of Dovedale may have furnished a recess which has retained them as relics of a colder climate.—R. G. ABERCROMBIE, M.D.

GIANT WOOD-WASP OR HORNTAIL AT BURNSALL.

On July 21st last, whilst walking in the Pine Woods between Burnsall and Barden I took a ♀ specimen of *Sirex Gigas* which unfortunately was dead and quite hard. The chief point of interest however is the position in which it was found. A casual glance showed it to be suspended from a larch tree by its tail, on what appeared to be a piece of wire. A closer examination revealed the ' wire ' to be the insect's ovipositar inserted in the bark of the tree. It appeared that the creature had died from exhaustion probably due to egg-laying, for the ovipositor was not very firmly fixed in the bark and death was evidently not due to the insect's inability to withdraw it.—M. D. BARNES.

## SOME YORKSHIRE DIPTERA.

CHRIS. A. CHEETHAM.

We have been fortunate this year in having visits from Dr. F. W. Edwards and Mr. J. E. Collin, and it is advisable to place on record the lists of species noted by these gentlemen which they have kindly sent along to me.

Those of Dr. Edwards were mostly taken on a walk up Ingleborough, but one of the biting midges, *Dasyhelea saxicola* Edw., I bred out from larvae Dr. Edwards pointed out to me and which were living in the black muddy material found in hollows of the limestone pavement on Oxenber. This species was named from material he obtained on Whitbarrow Fell.

Mr. J. E. Collin came to investigate the fly we have known as *Chiastochaeta trollii* Ztt., which lives as a larva in the Globe flower; he now finds that we have five species of this genus in Britain and he proposes to write up an account of the genus shortly; one new species came from an area of Globe flower at Ribblehead and other material was collected at Malham Moor and Helwith Moss. He was also anxious to see the curious melanoid race of *Melanostoma mellinum* L. that is found abundantly on the flowers of the Cloudberry on Pennyghent.

Dr. Edward's List.

*Dasyhelea saxicola* Edw.
*Ceratopogon crassinervis* Goet.
*Diamesa lacteipennis* Zett.
*Hilara niveipennis* Zett.
*Rhamphomyia nigripes* F.
,, *filata* Zett.
*Empis pennaria* Fln.
*Tipula cærulescens* Lack.
*Dicranomyia morio* F.
*Ormosia uncinata* de M.
*Verrallia setosa* Verr.
*Sciara nervosa* Mg.

Mr. J. E. Collins' List.

*Empis caudatula* Lw.
*Hilara bistriata* Zett.
*Melanostoma mellinum* var.
*Platychirus perpallidus* Verr.
*Sphærophoria picta* var *abbreviata* Zett.
*Ernestia truncata* Ztt.
*Lydina ænea* Mg.
*Onesia agilis* Mg.
*Polietes hirticura* Mde.
*Hebecnema umbratica* Mg.
*Trichopticus hirsutulus* Ztt.
*T. nigritellus* Ztt.
*Rhynchotrichops aculipes* Ztt.
*Pogonomyia brumalis* Rdi. (*meadei* Pok.)
*P.* (*Trichopticoides*) *decolor* Fln.

*Helina maculipennis* Ztt.
*Hydrotæa albipuncta* Ztt.
*Fannia ærea* Fln.
*Spilogona contractifrons* Ztt.
*S. solitariana* Collin.
*Pegomyia femorata* Stein.
*Hylemyia variata* Fln.
*Botanophila varicolor* Mg.
*Melinia karli* Ringd.
*Phorbia curvicauda* Ztt.
*Pegohylemyia discreta* Mg.
*P. humerella* Ztt.
*Delia exigua* Mde.
*Cordylura atrata* Ztt.
*Amaurosoma inermis* Beck.
*Themira pusilla* Ztt. (*spinosa* Verr.)

## THE J. J. MARSHALL COLLECTION OF BRITISH MOSSES.

T. SHEPPARD.

Many of our readers will remember the enthusiasm with which years ago the late J. J. Marshall, Chemist, of Beverley, collected Mosses and Hepatics, and took part in many of the excursions of the Yorkshire Naturalists' Union, particularly in East Yorkshire. Besides a large number of papers and records in *The Naturalist*, he contributed ' The Mosses of the East Riding ' to J. F. Robinson's ' Flora of the East Riding.' Marshall's extensive collection has been cared for ever since, and all the specimens have been carefully labelled and numbered. The numbers correspond with those in the *Census Catalogue of British Mosses*, second edition, 1926.

Mr. G. Allison, of Grimsby, has now presented this collection to the Botanical Department of the Municipal Museums at Hull, where already the Phanerogams and Ferns collected by the late J. F. Robinson, and referred to in his Flora, are preserved. There are also some slides of mosses made for microscopic work which were prepared by the late J. F. Robinson.

## ANIMAL WELFARE.

The Rt. Hon. Viscount Tredegar will (unless unforeseen circumstances prevent his doing so) introduce in the House of Lords next session, the bill promoted by the University of London Animal Welfare Society for prohibiting the steel trap or gin.

The steel trap causes severe and prolonged suffering to wild animals and birds and also to domestic animals which frequently get caught by it. Moreover, far from being necessary for keeping down rabbits, it is correlated with undue multiplication of these destructive animals ; in Devon, Cornwall, Pembrokeshire and part of Carmarthen the professional trappers, who are the principal users of the steel trap, have produced a plague of rabbits. It is believed that this is partly due to the trap catching far more males than females. The U.L.A.W.S. has published a pamphlet, ' Man versus Rabbit,' explaining the correct ways of catching and killing rabbits.

Encouraging news of progress in Animal Welfare work comes from Peiping, China, where Dr. Millard, travelling member of the Council

of the University of London Animal Welfare Society, is meeting with a good response to his appeals for the promotion of animal protection. Hitherto there has been no organization to protect animals, and the city is one where indifference to the welfare of animals strikes the humane man at every turn. Dr. Millard has been very fortunate in obtaining the hearty co-operation of the Editor of the *Peiping Chronicle*, and there is now a Chinese organizing committee at work. Before long there should be an Animal Welfare Society and some sort of animal refuge Funds are urgently needed and should be sent to Dr. A. S. Millard, B.M., B.Sc., D.P.H., c/o The University of London Animal Welfare Society, 68 Torrington Square, London, W.C.1, or in Scotland to him c/o The Scottish S.P.C.A., 19 Melville Street, Edinburgh, 3. Particulars of the work and aims of the Society may be obtained from the former address.

## NEWS FROM THE MAGAZINES.

*The British Mycological Society Transactions*, Vol. XVIII, Part 4, 1934. This issue contains ' A few interesting North American Smuts,' by R. Ciferri ; ' Notes on British Uredinales, including one new to the British Isles,' by W. B. Grove and C. G. C. Chesters ; ' A Comparative Study of the Fungi associated with Blight Diseases of certain cultivated Leguminous Plants,' by A. Sattar. J. Ramsbottom contributes ' Notes on Mycological Nomenclature,' and two papers of systematic importance are ' Remarks on a Collection of British Species of *Rosellinia* and a Redistribution of the Species of that Genus,' by W. Kirschstein, and ' Studies in the Genus *Ustulina*—with special reference to Parasitism. I. Introduction, Survey of Previous Literature and Host Index,' by W. H. Wilkins. A paper of special interest to Lichenologists is by O. V. Darbishire on ' The *Lichen Fucoides* of various Authors and its Fate,' which represents a painstaking research into the nomenclatorial history of *Rocella fuciformis* (L.) D.C. This is a well-illustrated issue which also contains Proceedings of the Society, the Society's Rules, and a list of its members.

*The Entomologists' Monthly Magazine* for June contains ' A contribution towards a knowledge of the genus *Aeolothrips* (*Thysanoptera*) with descriptions of new species,' by R. S. Bagnall (including *Aeolothrips intermedius* Bagn. from Ainsdale, Lancs. on *Euphrasia*) ; ' Systematic notes upon British aquatic Coleoptera,' by F. Balfour-Browne (notes on the genera *Noterus* and *Laccophilus*) ; ' Additions to our knowledge of the *Achilixiidæ* (*Fulgoroidea*, Homoptera),' by the late Dr. F. J. Muir ; ' The parasites of British Birds and mammals,' by G. B. Thompson (including notes on the association of *Hippoboscidæ* with *Mallophaga* and a record of a louse unrecorded from Britain namely *Neohæmatopinus sciurinus* from a grey squirrel) ; ' *Plutella porrectella* L. infesting Sweet Rocket in Oxfordshire,' by H. Scott ; ' Two species of *Scatopsidæ* (Diptera) new to Britain,' by F. W. Edwards (descriptions of *Aldrovandiella verralli* Edw. from Norfolk, Kent, Sussex, Hants., and Devon and *Scatopse richardsi* Edw. from Surrey) ; ' A new *brachypterous Sciarine* fly,' by F. W. Edwards (*Plastosciara agertoni* Edw. taken at Rostherne, Cheshire, by H. Britten) ; ' A new British *Forcipomyia* (Dipt. *Ceratopogonidæ*),' by J. W. S. Macfie and a few short notes.

*The Entomologist* for June contains ' A catalogue of the Noctuæ of Ireland,' by Lt.-Col. C. Donovan ; ' Gleanings from my Notebooks, VI,' by J. W. H. Harrison (notes on butterflies, mainly British) ; ' Hemiptera inhabiting a salt marsh on the south coast of Co. Cork, I.F.S.,' by Professor L. P. W. Renouf ; ' British Lepidoptera collecting, 1933, Part II ; July to the end of October,' by C. G. M. de Worms ; ' Notes on two collections of butterflies made in Palestine, with a note on the occurrence in Transjordan of an unrecorded species,' by F. Hemming and several Notes and Observations.

*The Naturalist*

# YORKSHIRE NATURALISTS AT FAIRBURN.

On June 16th we were favoured by the weather for this excursion, and thanks to the kind permission granted by the Airedale Colliery Co., we were able to get a bird's-eye view of the whole water area and its avian population, though this distant view did not satisfy the sections whose interests lay within the water or on the plants growing in the same.

The most striking feature of the vegetation lay just outside the area we examined, and was best seen from the Ferrybridge to Fairburn highway; here were damp areas, small fields, in fact, one solid mass of the pink flowers of Ragged Robin, and at the opposite end of the area another mass of uncommon flowers was made up of the yellow heads of the celery-leaved buttercup.

Flowering Plants (W. A. Sledge) : Chief attention was devoted to the marshes at the Newton end of the area. *Equisetum limosum* and *Glyceria aquatica*, as mentioned in the circular, form dense beds round the open water, with *Typha latifolia*, *Iris pseudacorus*, and *Scirpus lacustris* locally plentiful. Amongst the tall reedy vegetation, *Nasturtium amphibium* is plentiful, and a few tufts of *Carex gracilis* were seen. A feature of the more mixed marsh vegetation away from the reeds was the great quantity of *Ranunculus sceleratus*, and here *Nasturtium officinale*, *N. palustre*, *Stellaria palustris*, *Thalictrum flavum*, and *Hottonia palustris* were noted. *Conium maculatum* was plentiful by the river. The most interesting species seen, however, was *Juncus tenuis*, which was growing in some quantity over a limited area of swampy ground, where it has evidently been established for many years. Apart from its occurrence as a casual on waste heaps I know of only one other record in V.C. 64 for the species as an established plant, Mr. Albert Wilson having recorded it some years ago from Bentham. No time was available for working the limestone area bordering the marshes to the north, but on the return walk to Fairburn, Dogwood, Barberry, Spindle Tree, Hop, and Black and White Bryony were seen in the hedgerow bordering the road.

Bryology (F. E. Milsom) : Three areas were surveyed, namely : a Permian quarry near Newton ; an old Permian wall-top skirting Byram Park ; a stretch of ground by the side of the lake in Byram Park. In the first-named locality, the chief thing of interest was *Tortula cernua* Lindb., which had previously been found there by Mr. W. H. Burrell, and this constitutes a welcome extension to its distribution in V.C. 64. It was growing on similar ground to that which it inhabits in its other stations at Garforth and Sprotborough, in company with *Leptobryum pyriforme* Wils. and *Funaria hygrometrica* Sibth. On the old wall-top were found *Ceratodon conicus* Lindb.[1], *Phascum curvicolle* Ehrh., and *Tortula ambigua* Angstr. In Byram Park interesting finds were *Tortula muralis* Hedw. var. *aestiva* Brid. and *Bryum argenteum* L.var. *lanatum* B. and S.[1]

Mr. Burrell contributes the following notes on *Tortula cernua* : ' There is general agreement among Continental bryologists, such as Schimper, Brotherus, Limpricht, Husnot, C. Muller, and Monkemeyer that *Tortula cernua* is sparingly scattered over a wide area in Europe and usually on walls and rock crevices, usually as an upland plant, not reaching alpine regions, and descending to sea level in more northern regions. There is no reference to the peculiar soil conditions of the Yorkshire stations, and it is the more interesting that Braithwaite says that the plant was first found on a wall at Barwick.'

Lichens (W. E. L. Wattam) : Apparently the smoke effects from the surround of collieries and their coke ovens are inimicable to lichen growth. In the vicinity of Fairburn, including a short visit to Byram

[1] New to V.C. 64.

Park, near Ferrybridge, the absence of foliaceous species was most noticeable. The walls are chiefly of the Permian outcrop, and the species which denizen them are similar in many respects to the species occurring near to other industrial areas of South-west Yorkshire, and are those which are the better able to resist the smoky atmosphere. The following were noted :—

*Peltigera canina* Willd. Old quarry at Newton, on the ground.
*Xanthoria parietina* Th. Fr. Scraps on the walls.
*Candelariella vitellina* Müll-Arg. On walls and old palings.
*Lecanora muralis* Schær. Abundant on the walls.
*L. galactina* Ach. Abundant on the walls with its subsp. *dissipata* Nyl.
*L. varia* Ach. Old palings and Larch branches.
*L. conizæa* Nyl. Old palings and tree boles.
*Cladonia pyxidata* Hoffm. Wall tops.
*Biatorella pruninosa* Mudd. Mortar of walls.
*Lecidia sanguinaria* Ach. Old palings and boles of Scotch Pine.
*Bilimbia sabuletorum* B. and R. Encrusting mosses on wall tops.
*Verrucaria viridula* Ach. Mortar and stones of walls.
*V. nigrescens* Pers. Limestone quarry, Newton.
*V. muralis* Ach. Mortar and stones of walls.

Conchology : Mr. W. E. L. Wattam has forwarded to me the following list of molluscs observed by himself and other members of the Y.N.U. during their visit to Fairburn and district. In an old limestone quarry at Newton, near Fairburn, were found :—

*Clausilia bidentata* Ström.
*Pyramidula rotundata* Müller.
*Hygromia hispida* Linné.
*H. rufescens* Pennant.
*Vitrea cellaria* Müller.
*Arianta arbustorum* Linné.
*Helix aspersa* Müller.
*H. hortensis* Müller.
*H. nemoralis* Linné.

The lake at Byram Park was next visited, here were noted some ' quite large *Anodonta cygnea* Linné,' to quote from Mr. Wattam's notes, and also the following species were seen :—

*Unio tumidus* Retzuis.
*Limnæa peregra* Müller.
*L. stagnalis* Linné.
*Planorbis contortus* Linné.
*Paludestrina jenkinsi* Smith.

Diptera (Chris. A. Cheetham) : Diptera were neither plentiful nor troublesome as might have been expected with the warm weather. One of the most noticeable on the Umbellifers was the black and white chequered *Graphomyia maculata* Scop. and when sweeping the reeds, a Reed-borer, with well-marked wings, *Ceroxys crassipennis* F. was fairly common. The scarcity was most noticeable amongst the *Syrphides*, the best and most frequent being a small black Dronefly with spotted eyes, *Eristalis sepulchralis* L., there were a few *Helophilus lineatus* F. and an odd *H. pendulus* L. and one *Merodon equestris* F., the bulb parasite.

The following is the list taken :

*Tanypus punctipennis* Mg.
*Cricotopus sylvestris* (Fab.) Edw.
*Chironomous albofasciatus* Stæg.
*C. tentans* Fab.
*Isoneuromyia ochracea* (Mg.) Edw.
*Tipula luna* Wst.
*T. oleracea* L.
*T. pierrei* Ton.
*Prionocera turcica* Fab.
*Ptychoptera contaminata* L.
*Tricyphona immaculata* Mg.
*Symplecta stictica* Mg.
*Erioptera trivialis* Mg.
*Beris vallata* Forst.
*Leptis scolopacea* L.
*Dioctria rufipes* Deg.
*Dolichopus plumipes* Scop.
*D. pennatus* Mg.
*Syntormon pumilus* Mg.
*Xiphandrium caliginosum* Ztt.
*Pipunculus sylvaticus* Mg.
*Platychirus angustatus* Ztt.
*P. manicatus* Mg.
*Chilosia variabilis* Pz.

*Ascia podagrica* F.
*Eristalis sepulchralis* L.
*Helophilus lineatus* F.
*Merodon equestris* F. var. *narcissi*.
*Voria ruralis* Fab.
*Graphomyia maculata* Scop.
*Cordylura pubera* F.
*Cnemopogon apicalis* Mg.
*Tetanocera elata* F.
*Ceroxys crassipennis* F.
*Notiphila uliginosa* Hal.
*N. cinerea* Fab.
*Parhydra aquila* Fln.

Vertebrate Zoology (H. B. Booth) : All the species of birds mentioned in the circular were seen, with the exception perhaps of the Kingfisher. It is marvellous how such numbers and species of birds can find a living for themselves and for their families on a piece of water of such recent formation. It was formerly the nesting site of a large colony of Black-headed Gulls, but as the islands became submerged, these decreased. At present there would be about fifty pairs, most of which were nesting in a patch of dwarfed Willow Trees. Of Ducks, the Tufted Duck was the most numerous, ten or a dozen pairs being noted, together with two or three pairs each of Shoveler, Pochard, and Mallard. A duck of each of the two latter was followed by broods. Assuming that one of each pair was incubating, we calculated that there were about eight pairs of Great Crested Grebes on the water, and we thought the Little Grebe had slightly increased, several pairs being seen. A strict look-out was kept for the Black-necked Grebe (*Podiceps nigricollis*) a colony of which was reported to have nested on this water in 1928 to 1930 inclusive, but no sign of any could be seen. Coots were plentiful, some being followed by chicks, and a few Water-hens and Mute Swans completed the larger water birds.

In the smaller birds the Reed Bunting and Sedge Warbler were exceedingly common, and a Grasshopper Warbler reeled almost the whole time we were there, doubtless in the attempt to obtain a mate. Several of our members spent some time in a fruitless search for its nest. Another member, who was acquainted with the Marsh Warbler and thought the site eminently suitable for that species, failed to hear or see it.

In other vertebrates Water Voles were numerous, and a half-grown Common Shrew was caught alive and liberated. Roach was the only fish noted.

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## REVIEWS AND BOOK NOTICES.

**In Dame Nature's School,** by **S. N. Sedgwick,** pp. 239, 25 illustrations, 3s. 6d. net. (The Epworth Press.) This is a very readable book for children, about the wild creatures of the country side. It is brimful of the interesting experiences of three small children with 'Ganpa' who is a naturalist of many parts and much information. There is no attempt to write down to a juvenile level and the book may be strongly recommended for children of all ages, perhaps particularly those between eight and fourteen. Worried parents may also gain useful information for future use. The illustrations are photographs for the greater part. These and the form of the book are good, indeed at the price the book is excellent value.

**Attending Marvels ; A Patagonian Journal,** by **G. G. Simpson.** pp. 295, 1 map and 15 illustrations, price 12s. 6d. net (Macmillan and Co., Ltd). The day of heroic exploration is nearly over. The modern explorer is usually a scientist, who is concerned mainly with investigating some particular set of problems, rather than with mapping, often in blood and perspiration, an unknown territory. To the modern class

of explorer belongs the author of this book. In 1833, Charles Darwin landed in Patagonia from H.M.S. *Beagle* and collected a few fossil bones. These bones subsequently proved to yield one of the major scientific contributions of his voyage. Later collections showed that Patagonia possessed a luxuriant and unique set of these fossils, which have since become famous among palaeontologists. The author of this book was engaged, on behalf of the American Museum of Natural History, in making more exhaustive collections of these fossils. The bones themselves are engagingly discussed and their place in nature is lucidly indicated. But taking the book as a whole, they serve merely as a skeleton on which to develop a fascinating superstructure of Patagonian existence. The author is a keen observer of men and animals, he wields a lively pen and the result is an extremely readable book. Patagonia reveals itself as a windswept and nearly barren desert, along whose trails broken Ford springs replace the bones of camels. The latter are, however, represented by a singularly idiotic creature called the guanaco. Animals, daily gales, the scattered population, a revolution, all contribute to the humour and observation with which the book is full. So that while this is primarily a book for the naturalist, it is one which most people will enjoy.

**The Families of Flowering Plants; II. Monocotyledons,** by **J. Hutchinson.** pp. 243, Fig. 107, price 20s. net (Macmillan and Co., Ltd). The first volume of this work appeared eight years ago and dealt with the Dicotyledons. This, the second and concluding volume, deals with Monocotyledons. Frankly it is an ambitious work. Mr. Hutchinson has discarded the older systems of taxonomy, notably that of Engler and Prantl, and he has laid down a taxonomic system which attempts to shew the phylogenetic relationships of all the Angiosperms. He has accepted wholeheartedly and greatly developed the view which seeks to derive both Dicotyledons and Monocotyledons from a Ranalian type of ancestor. There is much to be said both for and against this view. It must certainly be admitted that Mr. Hutchinson's system and views greatly strengthen the case for it. The starting point from which the Monocotyledons are derived is the Butomales and Alismatales, which respectively closely resemble the Cabombaceae and Ranunculaceae in floral and carpellary structure. From these the most extreme types of Monocotyledon are derived. Perhaps the most striking innovation in the subsequent treatment, is the modification of the Amaryllidaceae, which are now made to include forms with a superior ovary, the main character of the new group being an umbellate, scapose inflorescence. Onions thus find themselves among new companions. It may finally be said that the keys and illustrations are excellent and quite up to the standard of the rest of the treatment. Altogether this is a notable contribution to taxonomy.

**Fungus and Other Diseases of Crops, 1928-1932,** by **G. H. Pethybridge, W. C. Moore and A. Smith.** Bulletin 79, *Ministry of Agriculture and Fisheries,* pp. 117, 15 Figs., 2s. net, postage extra. (H.M. Stationery Office). This is a publication of considerable value to economic botanists and mycologists, containing as it does a summary of the incidence of plant diseases during the five years preceding 1932. It is valuable because it summarises the records of the various diseases observed both by the official mycologists of the Ministry of Agriculture, and also by numerous other official and private contributors. Under the heading of each disease is given a summary of its occurrence during the period and also references to any research work done either on remedial measures or on the nature or properties of the causative organism. A mine of information is thus available in small space. Mycologists will also find useful the list of plant-pathogenic bacteria and fungi given at

the beginning. These are either new to science or else have not been previously recorded from Britain.

**A Textbook of General Botany,** by **R. M. Holman and W. W. Robbins.** pp. 626, Figs., 463, price 25s. net. (Chapman and Hall, London.) This is the third edition of this text book, which has already established itself as a thoroughly competent piece of work. It is complete, lucidly printed and written and profusely illustrated. The illustrations deserve a special word of commendation. They are either carefully chosen and excellent photographs, or else very clear and accurate diagrams. The present edition has been enlarged by the addition of fifty additional figures, by pages dealing with fossil plants and Climax plant communities and by small type paragraphs dealing with chemical and physical principles necessary to the understanding of certain physiological processes. In addition, the text and the figures have been reviewed and modified. This is a notable text book, suitable for the higher school examinations and for college students. It is complete to a book-plate and a waterproof binding, and is altogether a production of which authors and publishers may be proud.

Messrs. Wheldon and Wesley, Ltd., of 2-4 Arthur Street, W.C.2, have issued their **Catalogue No. 35 of Books, Periodicals and Pamphlets on Entomology.** It contains many very interesting items, several of them highly priced. Among those of interest in the general section may be mentioned Curtis's ' British Entomology,' £10 ; Donovan's ' British Insects,' £6 10s. ; the scarce Panzer's ' Fauna Insectorum Germanicæ,' £8 8s., and Stephen's ' Illustrations,' £6 10s. In the Coleoptera are numerous items including Fowler's ' Coleoptera of the British Isles,' £18, and the rare Lacordaire and Chapuis's ' Histoire naturelle des Insectes,' in the original wrappers, £9 10s. The Lepidoptera include Barrett's ' Lepidoptera of the British Isles,' with 504 hand-coloured plates, £20 ; several items from the ' Genera Insectorum ' ; Godart and Duponchel's ' Histoire Naturelle des Lepidopteres ou Papillons de France,' £30 ; the very scarce Hewittson's ' Illustrations of Diurnal Lepidoptera,' £16 ; Mosley's hand-painted Illustrations, £20, and Oberthur's ' Etudes de Lepidopterologie Comparee,' £165. Hymenopterological items of interest are Andre's ' Species des Hymenopteres d'Europe et d'Algerie,' very rare, £42 ; Saunders' ' Hymenoptera Aculeata of the British Isles,' £6, and the rare Vollenhoven's ' Pinacographia,' £7. The Diptera provide Kertesz's ' Catalogus Dipterorum,' £5 10s. ; Loew's fine ' Die Europaischen Bohrfliegen,' £6 6s., and Verrall's rare eighth volume on British Flies, £8 8s. There are also interesting items in Hemiptera, Orthoptera, and Neuroptera and in Economic Entomology there are Miss Eleanor Ormerod's ' Reports of Observations of Injurious Insects,' 1877-1898, £3 10s.

## NEWS FROM THE MAGAZINES.

The *Proceedings of the Leeds Philosophical and Literary Society* published in May contain two items of interest to our readers, namely, ' A Portrait of Joseph Priestley and some of its Associations,' by W. C. Walker, and ' The Structural Changes in a Woody Twig after Summer Pruning,' by E. Marjorie Wray.

The *Entomologists' Record* for May contains ' Lepidoptera at Maurin, Basses-Alpes, France (Addenda),' by W. Parkinson Curtis ; ' *Polychrosis littoralis* subsp. *annetensis* n. ssp. A new form of Micro-lepidopteron,' by Hy. J. Turner (Annet Island in the Scillies, taken by Dr. Smart flying in abundance over Armeria and heath) ; ' Notes on collecting in Norfolk in 1932 and 1933,' by Captain C. Q. Parsons ; ' Collecting Butterflies in Orissa (Bihar and Orissa), India,' by W. M. Crawford ;

' Donegal in 1933,' by Rev. Canon Foster ; ' Current Notes and Short Notices ' ; ' Nomenclature. The List,' by Hy. J. Turner, and supplements, ' British *Noctuæ*,' by Hy. J. Turner and ' Butterflies of the Upper Rhone Valley,' by Roger Verity.

In the *Proceedings of the Geologists' Association* issued July 27th, S. E. Hollingworth writes on ' Some Solifluction Phenomena in the Northern part of the Lake District.'

*The Entomologist's Record* for July-August contains ' Odonata (Paraneuroptera) from Peru and Colombia,' by W. D. Hincks ; ' The Cottian Alps and Turin in June-July, 1933,' by Rev. E. B. Ashby ; ' Nomenclature. The List,' by H. J. Turner, and supplements ' British Noctuae,' by H. J. Turner, and ' Butterflies of the Upper Rhone Valley,' by R. Verity. Among the short notes is a record of the Puss Moth from Barra in the Outer Hebrides.

The *Journal of the Society for British Entomology*, Vol. I, Part 1 (10th May, 1934) contains numerous notes and articles relating to British insects. Among these are ' Some breeding records of Hymenoptera,' by O. W. Richards (a Chalcid from *Anobium domesticum*, a Proctotrupid from a beetle pupa, and five Braconids from leaf-mining Diptera) ; ' Some breeding records of Diptera,' by O. W. Richards (including *Chloromyia formosa* Scop., a dipteron whose larvæ were found attacking roots of aconite) ; ' A note on Lepidoptera in the Isle of Wight,' by E. A. C. Stowell ; ' Coleoptera taken in Scotland in May and June, 1933,' by P. Harwood (several rare species noted) ; ' *Syrphidæ* (Dipt.) associated with flowers,' by A. H. Hamm (mainly species of *Chilosia*) ; ' Diptera taken in Scotland in 1933,' by E. R. Goffe (mainly in Inverness-shire) ; ' Some Diptera collected in the South of England in 1930-33,' by J. E. Collin and C. J. Wainwright (a long list containing several species new to the British list).

*The Transactions of the Society for British Entomology*, Vol. I, Part 1, contains ' On the eggs of *Notostira erratica* L. (Hemiptera, *Capsidæ*),' by C. G. Johnson (with three plates) ; ' On the identity of *Hemerobius limbatellus* of British authors ; with a revised key to the British species of *Hemerobius* (Neur.),' by F. J. Killington (with four plates. Our British species is *Contumax Tjeder* and has been taken in Yorkshire at Buttercrambe Woods by J. M. Brown) ; ' The feeding habits of British Mecoptera ; with a synopsis of the British species,' by B. M. Hobby and F. J. Killington (with two plates. These insects feed on dead insects and are not predaceous as formerly thought) ; ' A provisional list of Cornish insects. Part I, Introduction and Hemiptera,' by the Rev. A. Thornley ; and ' A bibliography of entomological notes and papers contained in the serial publications issued by local scientific societies in the British Isles. Part II,' by B. M. Hobby (containing references to the Bradford Scientific Journal).

In *Man* for June, L. S. Palmer has an article on ' Another Palæolith from Yorkshire.' There are illustrations of the side, front, and end view of the specimen and reference to various papers and opinions. It is considered that the implement may be Late Lower or Early Middle Palæolith, or Late Acheulean or Early Mousterian. The author frankly admits, however, that ' Since the implement was not *in situ* it would be unwise to base any specific deduction on the provenance of the find.'

*The Entomologist* for May contains ' *Coleophora laripennella* Zett., *C. annulatella* Tengst., and *C. tengstromella* Dbld,' by F. N. Pierce and J. W. Metcalfe ; ' British Lepidoptera collecting, 1933, Part II ; July to the end of October,' by C. M. de Worms ; ' Note on the Geographical Variations of *Argyronome paphia* L.,' by R. Verity ; ' A Collecting Trip in the Vosges and Bas-Rhin districts of France ; Trichoptera, Plecoptera, and Neuroptera,' by M. E. Mosley ; ' The type of the genus *Pyrgus Hubner* (Lepidoptera *Hesperiidæ*) ; a correction,' by F. Hemming and numerous Notes and Observations.

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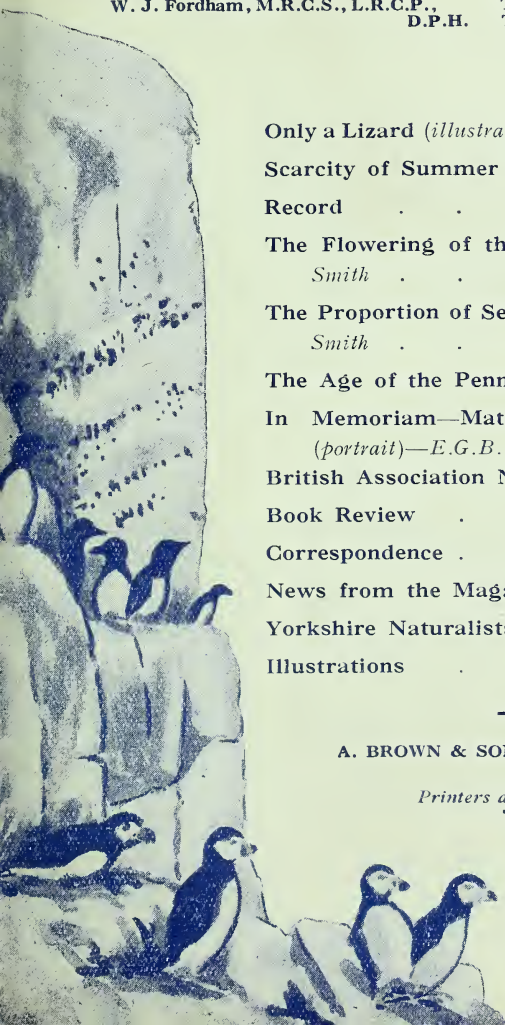

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# YORKSHIRE NATURALISTS' UNION.

## GEOLOGICAL SECTION.

THE ANNUAL MEETING of the Geological Section will be held in the Department of Geology, University of Leeds (No. 5 Hillary Place), on Saturday, October 6th, at 3 p.m.

H. C. VERSEY,
*Hon. Sec.*

## BOTANICAL SECTION.

THE ANNUAL MEETING of the Botanical Section will be held in the Botanical Department of the Leeds University, Room 29, in the main building at 3-30 p.m., on October 13th, 1934.

Business :—To discuss the Annual Report and suggest Officers and Members of the various Committees.

CHRIS. A. CHEETHAM,
*Hon. Secretary.*

## VERTEBRATE SECTION.

TWO MEETINGS will be held in the library of the Church Institute, Albion Place, Leeds, on Saturday, October 20th, 1934, at 3-15 and 6-30 p.m.

At 3-15 p.m. to consider and pass (*a*) Sectional Reports for 1934 and to elect Officers for 1935 ; (*b*) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1934, and to recommend this Committee for 1935 ; (*c*) The Reports of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1934, and to recommend this Committee for 1935.

The following papers will be given :—

'With Temminck's Stint in Scotland,' by J. R. Edwards.

'The River Ouse and its Fishery Problems' (illustrated), by S. H. Smith, J.P.

'Animal Life of Central Africa' (motion pictures), by F. H. Edmondson, F.Z.S.

Members and Associates are cordially invited to attend and to bring notes, specimens, and lantern slides. Will Officers of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR, *Hon. Secretary*,
13 Chestnut Avenue, York.

## ENTOMOLOGICAL AND PLANT GALLS SECTIONS.

THE ANNUAL MEETING will be held on Saturday, October 27th, at the Church Institute, Albion Place, Leeds, at 3 p.m. and 6 p.m. and Members and visitors are requested to bring exhibits.

*Agenda* :—

3-5 p.m.—Exhibition of Specimens.
6 p.m.—Nomination of Officers and Business.

W. D. HINCKS (*Hon. Sec.*),
46 Gipton Wood Avenue,
Leeds, 8.

**NOTE.**—Serial numbers of *The Naturalist*. Owing to printer's error the issues for June, July, August and September for this year have been numbered incorrectly 701, 702, 703 and 704. The correct numbers are 702, 703, 704 and 705.

## ONLY A LIZARD.

LIEUT.-COL. R. H. ELLIOT.
(*Late of the Indian Medical Service*).

'Oh, *do* come along, its *only* a lizard.' Her companion was gazing at Case V in the Reptile Gallery of the South Kensington Museum, and the petulant and impatient remark set me thinking and carried me back into a past so dim and distant that imagination simply failed in the retrospect. She was not even correct in her facts, for the animal at which she was

*Photo by*] **Sphenodon.** [*F. W. Bond*

looking wasn't a lizard at all; it was Tuatera—'The Spiny One'—as the Maoris have named it. All the same, she may be forgiven for mistaking it for a lizard, for it certainly looks like one, with its dark olive green skin speckled with yellow, with its iguana-like shape, crest and all, and with its body sagging lizard-fashion on the rock on which it stands perched. Indeed, scientists shared her error for many years until a closer study, especially of the skull, showed that Tuatera is much more nearly related to the crocodiles than to the lizards. It is indeed an animal that deserves our deepest and most respectful interest, for Sphenodon punctatus, to give it its official name, is the most primitive of all living reptiles and the sole survivor of a group which dates back many millions of years to Triassic times.

Let us take the wings of thought and travel far back in

time. There was an era in the world's history, hundreds of thousands of years ago—it would be rash to commit oneself to an exact date—when man, who now lords it so proudly, was unknown on this earth. The great class of mammals from which he sprang was working steadily upward toward the appearance on the world's stage of 'the heir of all the ages.' This process of mammalian ascent was to take many millions of years. Had it been possible in that far distant time for a biologist of to-day to have watched the dawn of the mammalia, how hard he would have found it to guess what their ultimate role in the world was going to be, and yet he would have been standing in what were comparatively recent times. We must travel back in fancy over still many more millions of years before we come to the 'era of the reptiles,' to the time when those strange and fearsome animals had obeyed the command to 'be fruitful and multiply and replenish the earth.' It was a reptile world indeed, and the gigantic fauna of that era were then earth's aristocracy. It would be hard to say how far we have gone back now. Some would put it at 150 million years; we are approaching the dull grey dawn of the 'reptile age.' Here, in the Triassic period, or even before it, we first meet with Sphenodon punctatus, whom this child of the latest era called contemptuously 'only a lizard.' She forgot, or more probably she did not know, that our own boasted civilisation may well one day be swept away by the hand of time, just as completely as was the kingdom of the giant reptiles. Who knows? For 'Is not earth as yet so young?'

For some time past the Britisher has been unable to see a living specimen of Tuatera unless he goes to the Antipodes for the purpose. This rare and wonderful animal which, until recently, was abundant in New Zealand, has been exterminated even there on the Mainland and now is to be found on only a few small islands near the coast. Recognising that it is a living relic of a dim and distant past, the New Zealand Government has taken steps to preserve it alike from the hawks and sea-birds which prey on it and from human raiders. So stringent have their regulations become that even our Zoological Society of London cannot obtain a specimen. Quite recently a fresh effort was made through private sources to overcome this difficulty, and the very suggestion that it might be possible to do so sent a flutter through the Reptile House in Regent's Park. But the arrangements to get a pair of these animals fell through. Then suddenly an anonymous friend of the Zoo walked in without warning and presented The Gardens with a delightful specimen of this, one of the strangest beasts still alive on the earth, but alas, the spiny one speedily died. Such a claim

as the above is no extravagant one, for the biologist speaks of Sphenodon as being ' the almost ideally generalised type of reptile.' This phrase may need a word of explanation, but indeed it is not nearly so alarming as it sounds ; we often find a number of closely allied orders of the animal kingdom, such as lizards, snakes, and crocodiles, each differing from the other in important respects, and yet with many common characteristics ; when we can trace back the various differing types to a common form from which all the animals alike *may* have sprung, we look upon this form as probably being in the direct ancestral line of all the others, or at least as being closely related to a form in that line. Sphenodon stands close to the ancestral root of the lizards and snakes, as well as to that of the crocodiles. It was a junction, a parting of the ways of these stocks which were destined in after ages to travel so far apart, each from the others. It was Nature's clearing house where she halted to take breath in one of those great series of marvellous experiments to which we apply the general term ' evolution.' In the womb of time Sphenodon held the germ from which not only the crocodiles and lizards, but also the snakes, the birds and the mammals were one day to spring. This does not necessarily mean that it was in the direct line of descent, but it was certainly very near it.

One asks oneself again and again, how came it that when some such primitive form was to be the starting point of so many important orders of the animal kingdom, and when such immense changes in each of those orders was first in prospect and then gradually carried out, how came it that one small group has remained practically unchanged for a hundred million years or more? Go and stand in front of Case V ; look at Sphenodon, poised there with its head erect, with the calm look in its large quiet eyes, imposing and dignified despite its want of size—for it only grows to a length of about two feet ; then think back if you can a million and a half of centuries and see it still standing on a rock with the same crest of spines on its head and down its trunk and tail, and with the same chisel-like teeth which have earned it to-day the name ' Sphenodon ' or ' The Wedge-toothed One.' It is accused of biting with those chisel-teeth with a savage ferocity that belies its quiet and dignified demeanour. At home in New Zealand, Tuatera is reputed to be a sluggish animal, but might it not well be slow in the up-take with that great ancestry behind it. It is said to sleep during a great part of the day and to love to live in the water and even to spend hours at a time beneath its depth without breathing. ' The Spiny One ' has some queer habits too, for each individual lives a bachelor or spinster life in a burrow of its

own which it digs out for itself. The hole consists of a tunnel leading to a roomy chamber lined with grass and leaves. For some strange reason best known to itself, Tuatera shares its lonely home socially with a family of petrels. Rumour has it that the birds are always made to occupy the left side of the burrow, so that evidently the reptile has an idea of his own dignity, or at any rate, has a regular and well ordered mind. During the breeding season the male is very talkative, his language being that of grunts and croaks. The eggs, which are over an inch long and which are buried in clutches of about ten in a hole in the sand, take more than a year to hatch, some say thirteen months. With such a pedigree Sphenodon can afford to be individualistic, if not eccentric, as compared with the bulk of living animals.

One last look before you turn away, and this time at Sphenodon's skeleton standing near the stuffed animal. The Irishman is said to have constructed a cannon by making a hole and pouring iron round it. Sphenodon's skull seems to have been built on this simple principle, for it is just a number of holes with rims of bone round them. Indeed, this characteristic is one which has powerfully attracted the attention of biologists and influenced them greatly in the animal's classification. Nor is this all there is to say on the subject, for in the centre of the forehead is found a vestige of the pineal eye, that Cyclopean structure which has intrigued biologists so much. A rosette of scales surrounding one which is centrally placed and transparent, shows the situation of this organ. It has undoubtedly the structure of an eye, but there is no evidence that it is functional. The focussing on it of a strong beam of light elicits no response from the animal. Vestiges of the pineal eye have been found in lizards and snakes. The larva of one of the lampreys, those very rudimentary fish, presents a quite rudimentary pair of lateral eyes and a large pineal eye. It would almost seem that nature toyed with the idea of a third eye and was greatly attracted to it, and yet gave it up as unpractical. It is a structure that has somehow gone wrong in the course of evolution. What a happy thing it might have been for many a blind man if the Sphenodon's idea of a third eye had proved a workable proposition. Such an organ in reserve would have been invaluable indeed.

At the top of the Case in which Tuatera is to be seen you will find a near relative of ' The Spiny One,' and a strange beast indeed. It has been named Dimetrodon incisivus, and is surely one of the queerest animals that ever walked this earth, for the spines of its two dozen or more vertebræ are each between two and three feet long and carry an extraordinary median frill of skin. It would be bad to sit down upon and

worse to swallow, though this is but a guess at the purpose of this weird fan-like crest that it carries. It was too fancy a creature to survive in a rough-and-tumble world, and when the giant lizards and the many other enormous reptiles of that long ago Triassic time passed away, Dimetrodon glided silently out with them into the night of forgetfulness, leaving its more elemental colleague to live on to interest and intrigue us to-day.

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## SCARCITY OF SUMMER BIRDS.

GEORGE BOLAM.

It would be interesting to hear more of what has been the case in other parts of the country, but in Upper South Tynedale, particularly in that portion of it which I have called ' The East Nook of Cumberland ' (lying to the east of the Pennine Range), the scarcity of many of the commonest of our summer birds has this year been quite depressing. The gradual decrease of some of them has been notable for some years past, but this season it has reached such a climax as to have become painfully conspicuous, even to the least observant persons. The district embraces ideal nesting ground for such lovers of wild fell, scrub-clad braes, and drystone walls, as Wheatears, Whinchats and Pipits, all of them, hitherto, amongst the most abundant of our summer birds. The two first-named species have for a year or two back been becoming scarcer and scarcer, to our wonderment and dismay ; but this year, when even the homely Pipit, which ought to dance its way before you on every moorland walk, has so nearly vanished, it seems time to call attention to the matter, to enquire what the cause can be, and whether other districts have been similarly affected.

Wheatears, until some four or five years ago, used to nest all round us here, often two or three nests in the same roadside wall, but the number has gradually decreased, and this year there has not been a single nest within several miles. It may have no bearing upon the matter, but it may be worthy of mention that one of the last Wheatears to be seen actually within our garden was a crippled individual which appeared on April 2nd, 1930, and was picked up dead next day, dissection disclosing the fact that it had been killed by ' Sparrow-drift.' As I do not believe that there are any shooters of small birds in this dale, nor anyone who uses such small shot, the inference might be suggested that the bird had received its wound elsewhere, but had carried on (perhaps for a long distance) to yield up the ghost near its home.

*1934 Oct. 1*

Whinchats have been similarly disappearing from their accustomed haunts. Formerly one of our commonest summer birds, I do not think there has been a single nest for miles around, this season, where formerly a dozen nests might have been seen in course of a day's walk. Hardly any of the birds appeared this spring. One little party of four pairs was found on the evening of May 31st in a young plantation of firs on a hillside, a typical nesting site, but they were evidently new arrivals, keeping in a compact body, and being quite silent (unusual behaviour for Whinchats !), but not a single pair remained to nest there, and I have not seen more than one brood of fledged young ones this year over a very considerable area. This brood was on a roadside some three miles away, surrounded by bushy, hummocky ground, such as Whinchats love, and one of the objects of our walk that afternoon was a quest for these birds. Curiously enough, the first individual to attract attention was the adult cock, recently run over by a car and squashed flat upon the macadam ! Shortly after, his widow and her family began to appear.

Even such a universally abundant bird as the Willow-Warbler has been quite scarce here this summer, and, as already stated, Meadow-Pipits seem to be vanishing. We have no Wood-Wrens, nor Blackcaps and comparatively few Redstarts, Whitethroats, or House-Martins. Corncrakes have been disappearing from this part of the country, as from other districts, for several seasons past.

Contrariwise, it may be interesting to note that Yellow Wagtails and Goldfinches, neither of them common birds in these parts, seem to be steadily increasing. While it may be added that I am unaware of any changes in agriculture or otherwise that might be supposed to have any bearing upon the decrease of small birds.

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## RECORD.

EUMERUS TUBERCULATUS ROND. (1857) DIPTERA-SYRPHIDIDÆ, IN YORKSHIRE.

PREVIOUS to 1920 (Collin, *Ent. Mon. Mag.*, LVI, 1920, p. 102, Pl. III) this Narcissus Fly has been confused with the closely allied *E. strigatus* Fall. (1817). It is quite readily separated by the characters of the posterior legs indicated by Mr. Collin. I have a single male example before me taken by Mr. John Wood in the Keighley district on the September 9th, 1933, which, as far as I recollect, is the first capture in the county.—W. D. HINCKS.

## THE FLOWERING OF THE ASH IN 1934.

A. MALINS SMITH.

THE extraordinarily abundant flowering of the Ash in the spring of this year gave an excellent opportunity of observing the state of the flowers, and of this I availed myself with the results which follow. These amplify the note already given by Mr. Cheetham in *The Naturalist* for July. I found the Ash trees to be, as regards their flowers, in the following conditions :

(1) Wholly male.
(2) Mostly male ; on theset rees most of the flowers were male, with an occasional hermaphrodite flower in some inflorescences.
(3) Having all flowers hermaphrodite.
(4) Having all flowers female with small and, I think, non-functional stamens. If this latter supposition is not correct, then classes 3 and 4 are identical.

I took notes of the flowers within reach on each tree, but it was impossible from ground level to examine more than a few of the flowers on a large tree. I think, however, that these lower flowers were in most cases a correct sample of those on the whole tree, for out of 22 trees recorded as entirely male at the time of flowering, only one later developed any fruits and this tree had only one small bunch.

If we take these observations to be sound, then the following figures relating mainly to trees in the Shipley neighbourhood result :

Of 53 trees examined 22 were entirely male, 2 mostly male 23 hermaphrodite, and 6 female.

If these be a representative sample then almost one-half of the Ash trees of this neighbourhood are incapable of bearing fruit and this fact should be always kept in mind in judging the fruiting of the Ash. In fruiting we have three classes :

(1) Heavy fruiters in a good year, *i.e.* those trees with hermaphrodite and those with functionally female flowers.
(2) Shy fruiters, those which have a few hermaphrodite flowers among many male.
(3) Non-fruiters, those which have male flowers only.

The question arises whether trees are uniform in the character of their flowers from year to year. Most of the above 53 trees are marked and accessible in the neighbourhood, and it is intended to examine these next year to get data on this point. Already, however, evidence on this point is available, for the stalks of the fruits remain on the branches for some time and it is thus possible to tell those trees which have fruited in

previous years. The absence of such wisps of fruit stalks may be taken as presumptive evidence of a male tree. From this evidence it appears that in most cases trees retain their maleness or otherwise from one year to another. Mr. M. Malone informs me that he has noticed two trees in Lister Park, Bradford, one of which has been a regular fruiter and the other a non-fruiter for about 30 years. This being the usual state of affairs, it is interesting to record one tree which had previously borne fruit in considerable amount, as evidenced by the wisps of fruit stalks on it. This year, however, it had an overwhelming preponderance of male flowers. The very few hermaphrodite ones have not developed into fruits, and though the season has been favourable for the fruiting of Ashes, it has no fruit.

It is, of course, possible that trees with the hermaphrodite and female flowers may not successfully develop fruits. This may be an effect of season, and last year when Ash fruits were almost non-existent there must have been many such. It may also, I think, be an effect of situation. An Ash tree near the centre of Bradford was this year heavily laden with functionally female flowers, which developed up to a certain point and then all the young fruits fell off. This may have been due to their not being fertilised or to the adverse climate of the city. Accidents can also befall male trees. One large male tree near my house bore abundant flowers at the stage previous to anther opening. They never developed further and no opening out of the inflorescences occurred nor shedding of pollen. The undeveloped flowers remained on the branches long after the leaves were developed. This occurred also in a few other trees casually noted by me. The cause is obscure. The season was mild and the particular tree specially observed was close by a stream, and therefore drought did not enter into the question. The general course of development of fruits in this neighbourhood was marked by two features: (1) a bronzing of the young fruits with anthocyan in early June. This colour by the beginning of July had faded and the fruits were normally green ; (2) a copious shedding of young fruits in the third and fourth week in June.

A question of interest is whether the above proportions of sexes hold for other districts. As to this I can only say that I am writing from Austwick and my observations here agree with those at Shipley. There appear to be almost as many barren as fruit-bearing trees in this district. I take it that the barren trees are male, as the season has been such that practically all trees capable of bearing fruit have done so.

It remains to notice that some trees have enormous crops this year and I have one under observation which, while

producing such a crop, has developed very few leaves. Many of the lower branches have no leaves at all, so that apart from the fruit the tree seems to be almost dying. Whether the excessive crop is a cause of this I do not know.

## THE PROPORTION OF SEXES IN THE HOLLY.

A. MALINS SMITH.

THE Holly flowered profusely in 1934, and I took the opportunity of making a record of the proportion of male and female trees among those examined. I made no attempt at a complete survey, but as the trees were examined entirely at random, they should be a sample of the general distribution. There were :—

| | *Male.* | *Female.* |
|---|---|---|
| In Spring Wood, between Baildon and Hawksworth ... ... ... ... | 16 | 9 |
| At Bolton Abbey, and near Marley and Cottingley... ... ... ... ... | 6 | — |
| In Bastow Wood, Grassington ... ... | 4 | — |
| | 26 | 9 |

About one-quarter only of the trees examined were female, and it would be interesting to know if this proportion is exceptional or representative.

## THE AGE OF THE PENNINE PEATS.

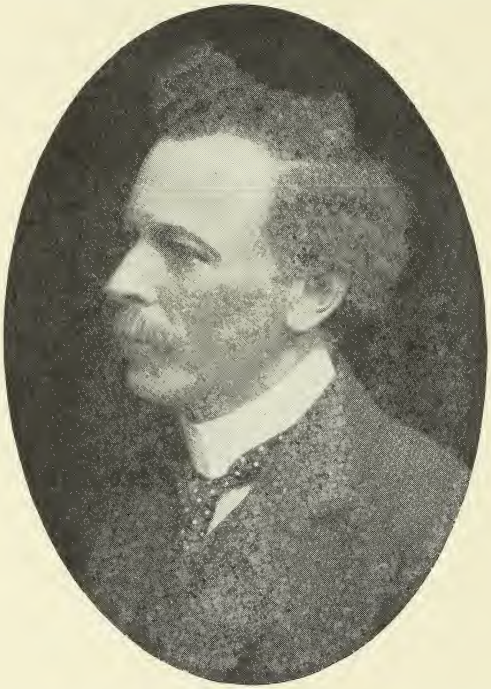
In *Man*, 1934, pp. 68-69, Dr. H. Godwin and Mr. J. G. D. Clark give short summaries of their studies of an Early Bronze Age Site in the south-eastern Fens and compare their results with those found on the Pennines. The implements found by Buckley at Warcock Hill and referred to by Woodhead and Erdtman (*The Naturalist*, 1926) are reconsidered. What were then regarded as Late Neolithic tools are now said to be Early Bronze Age and that ' if the general correlation of the Bronze Age with the Sub-Boreal climatic period of Blytt and Sernander be assumed to hold in this country as in continental N.W. Europe, then the Warcock Hill series give a valuable correlation point between forest history as shown by pollen analysis, and climatic and archæological periods. The lowest Warcock Hill peats must, on this basis, be considered to be Sub-Boreal, in contrast to the early Atlantic age attributed to them by Woodhead and Erdtman, and more recently accepted by Raistrick.' The basal peats of the Warcock Hill series do not show the indices for the Boreal-Atlantic transition period and therefore there seems no reason to doubt the validity of the archæological evidence, which points to Sub-Boreal age. They further say that ' this argument and conclusion may be fairly applied not only to the interpretation of the Warcock Hill peats by Woodhead and Erdtman, but also to the interpretation by Raistrick of analyses of peats at Truckle Pits, Barden Fell.' According to this evidence the Pennine Peats were formed under the warm, dry Sub-Boreal conditions and not under the warm, moist Atlantic conditions in Late Atlantic times as suggested by Woodhead. At the conclusion of his note Mr. Clark says, ' As an archæologist one can do no more than record one's concern at the anomaly which is at any rate apparent—and lapse into that puzzlement in which archæologists seem condemned to exist.'

# In Memoriam.

## MATTHEW LAWSON THOMPSON

Born 23rd June, 1866—Died 8th August, 1934.

The Yorkshire Naturalists' Union in general and its Entomological Section in particular have suffered a severe loss in the tragic death of one of its oldest and most valued



members in the person of Mr. M. L. Thompson of Middlesbrough. When quite a young man he joined the Union, being elected a member at the Annual Meeting held at Hull, November 20th, 1889. He had already commenced the study of Coleoptera, and *The Naturalist* for the following year records a number of species taken by him on Roseberry Topping on the occasion of the Y.N.U. excursion to Kildale, July 12th, 1890. From that time to the present, few volumes of *The Naturalist* are without his name among the list of contributors. His advent gave an impetus to the study of Coleoptera in Yorkshire which at that time had but two exponents who were working in splendid isolation. One of these, the Rev. W. C. Hey, M.A., had commenced the publication of a list of Yorkshire Coleoptera, which was proceeding tardily in

the Transactions of the Union. He had, perforce, to depend upon his own exertions and the published records of the older Naturalists, which latter became fewer and fewer as he approached those families which had received little attention. The publication of the fifth and sixth sheets (pp. 65-96) revealed the quality of Mr. Thompson's enthusiastic work, nineteen species being included on his sole record, while he supplied additional localities for seventy-eight others. At this point Mr. Hey's increasing ill-health compelled him to relinquish the task and it became necessary to devise other means to carry it on to a conclusion. Through the instrumentality of the far-sighted secretary of the Union, W. Denison Roebuck, the Yorkshire Coleoptera Committee was formed in 1898, with the complementary objects of 'the systematic investigation of the Coleoptera of Yorkshire at the excursions and elsewhere and to assist Mr. M. L. Thompson in preparing the continuation of the list of Yorkshire Beetles commenced by Mr. Hey.' Of the original members forming the Committee he was all but the last survivor. He acted as convener from 1898 to 1905, when he became Chairman. He was again made Chairman in 1917, adding to it in 1923 the positions of convener and representative on the Executive. These three positions he held from that time until his death. He was elected a Fellow of The Royal Entomological Society in 1901.

In 1906, Mr. Thompson and the writer were invited to draw up a list of the Coleoptera of Yorkshire for the Victoria County History of York. This appeared in the first volume of that work published in 1907 and is based on the work of the Coleoptera Committee. Its appearance was not the signal to cease work, but an incentive to increased investigation.

Year by year at the Annual Meeting of the Entomological Section the Coleopterists, who once were neglible in numbers, now take a large share in the proceedings, and not a year has passed without additions to the list and additional records for new stations being made. These are brought for exhibit and inspection and invariably Mr. Thompson had a good show of both. During the past ten years he had added the study of Hemiptera to that of Coleoptera and as might be expected had done valuable work in it. His last contribution to *The Naturalist* is in the number for April of the present year, and deals with this once neglected order of insects.

His interests, though mainly Entomological, were by no means confined to that branch of science, *e.g.* in *The Naturalist* for January, 1892, he contributed 'Some notes on the Long-eared bat in captivity.'

In his own district he was a member and past president

of The Cleveland Naturalist's Field Club, to which he had belonged for 39 years, and to whose proceedings he had contributed full records of local Coleoptera and Hemiptera. This recital of the facts of the scientific side of Mr. Thompson's life may appear bald and uninteresting, but they show him as a pioneer who has left behind him established work which may be added to, but cannot be neglected nor superseded. His work is indeed his memorial. It is much to be desired that his collection will not be dispersed nor pass out of the county. Either would be a catastrophe to be deplored.

Soon after his election to the Union we were brought together and quickly made friends. We worked together during the strenuous times from 1898 to 1906 when our list was in the making, the few differences of opinion which arose serving to increase rather than lessen our friendship. I visited him some thirty-five years ago at Saltburn, where he was living with his widowed mother, and several times afterwards at Middlesbrough, where he removed after her death to be near his business. Our correspondence might be called voluminous, and his presence at the Annual Meeting of the Section was looked forward to with pleasant anticipation.

It came as a great shock to learn of his accidental death by drowning on August 8th last. He was a bachelor and of a retiring disposition, but his enthusiasm for his studies and his sunny natue won for him many friends in the world of science, By these his loss will be keenly felt, by none more than by the writer of this poor tribute to his memory.

E.G.B.

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## NEWS FROM THE MAGAZINES.

*The Entomologist's Record* for July-August contains '*Odonata* (*Paraneuroptera*) from Peru and Colombia,' by W. D. Hincks ; 'The Cottian Alps and Turin in June-July, 1933,' by Rev. E. B. Ashby ; 'Nomenclature. The List,' by H. J. Turner. Notes on Collecting and Current Notes and Supplements, 'British *Noctuæ*,' by H. J. Turner, and 'Butterflies of the Upper Rhone Valley,' by R. Verity.

*Transactions of the North Staffordshire Field Club* for 1934 contain, in addition to the customary reports of sections and meetings, an account of the opening of the Memorial Gateway at the Hawksmoor Nature Reserve, including the speech of the Poet Laureate, Mr. John Masefield, in declaring it open. The gateway commemorates the work of John Richard Beech Masefield, who was largely instrumental in establishing the Nature Reserve.

Other articles deal with Staffordshire Neuroptera and Mecoptera, by H. W. Daltry ; 'Bird Notes from Stone,' by P. C. Dutton ; 'Medieval Glassworkers in North Staffordshire,' by T. Pape, and the discovery at Cheadle, by Miss M. E. Masefield, of some beautifully carved fourteenth century heads, thought to be of Edward III and his wife, Philippa. The Presidential Address, by A. Hilton John, deals with the history of Pembrokeshire.

*The Naturalist*

# BRITISH ASSOCIATION NOTES.

A CENTURY ago the British Association had its fourth meeting in Scotland. *The Observer* for September 14th, 1834, had the following report of the meeting :—

' The fourth great meeting of the British Association for the Promotion of Science opened on Monday in Edinburgh and was crowded by men of science from all parts of the world. The President of the meeting is Sir T. Brisbane ; and the Vice-Presidents are Sir David Brewster and the Rev. Dr. Robinson, Astronomer-Royal of Armagh. Professor Sedgwick, the chairman at the Cambridge meeting, resigned his presidency to Sir T. Brisbane. The treasurer reported that the Association at its commencement at York, numbered 350 members ; at Oxford they increased to 700 ; and at Cambridge, last year, to about 1,400. At Edinburgh it already included 2,200 and would be increased next day to 2,400. Professor Robinson said the great Halley comet was calculated once more to appear at the end of the year, although it would not make its nearest approach to the earth till January 6th, 1835. It is stated that at the evening meetings at Cambridge not a male was permitted to take a seat until every lady was provided with one, but at Edinburgh the gentlemen are not so courteous.'

## THE 1934 MEETING.

The Aberdeen Meeting, just over, gave some indication of the progress in science since that date. The ' Granite City ' is beautiful, clean, and well planned. Its public buildings and principal streets are carefully designed, and on the evenings the ' flood-lighting ' gave a fairy-like appearance to the whiteness of the granite of which Aberdeen is built. Its pioneers of town-planning have produced a dignified city, and its university and other public buildings provided ample accommodation for the various sections of the Association's activity. Sir Josiah Stamp, the Hon. Treasurer, announced that very close upon three thousand members attended at Aberdeen. And we hear that that comparatively small city had subscribed four thousand pounds towards the cost of the meeting.

## LECTURES AND LECTURERS.

We have complained over and over again of the apparent inability of many of the lecturers to give audible and understandable discourse. We have also previously suggested that each section should ' edit ' the various and numerous contributions submitted, and that more care should be taken to adhere to the times given for the talks. In the multitude of papers and addresses a visitor has to choose those likely to interest him the most, and as these are often held in places far apart, it is annoying and a waste of time to appear in a section at a definite time to hear a particular paper, only to find a discussion taking place upon a previous paper, which is of no particular interest and often unintelligible. We see that *The Sunday Observer* for September 16th is of the same opinion. It says the ' welcome evidence of the capacity of some scientists to interpret their results, does not invalidate the powerful plea made by Dr. Tizard and many others for a much higher level in the ability to speak and write his own language well on the part of the average scientist. Only when it is the rule and not the exception to find a scientific worker who can interpret in accurate and lucid English the significance of his investigations can we expect to encounter that general appreciation of the value of science which will facilitate the smooth translation of scientific results into the service of the community.'

## THE PRESIDENT'S ADDRESS.

The address by the President of the British Association for the

Advancement of Science, probably provided the finest free entertainment to the Aberdonians since the days of Barnum's Circus, when the elephants and zebras slid about on their slippery granite sets. The address was given in the city's super-cinema in the main street, and all Aberdeen not in the cinema stood along and across the street to see the scientific lions, lionesses, and cubs, among whom, of course, were a few of the *rara aves* or super-scientists, the Red Lions, who brood no red lionesses, though they have cubs.

Dukes' sons were cheek by jowl with cooks' sons, and with the dukes and cooks themselves. Reserved seat ticket-holders, together with the people entitled to get in ' if room,' all joined in a grand procession, and the boiled shirts of the men, and the shawls, silk mandarin robes, and dresses of the women, provided a free mannequin parade such as had never been seen in the ' Granite City ' previously, and certainly never will be again.

Human windmills in the form of yellow-liveried cinema colonels and generals, in ridiculously large Mickey Mouse white gloves, ' shooed ' indignant officials and holders of reserved seat tickets, along with the common herd, into the thin red line.

### The Cinema.

The police, who are ' simply marvellous ' in Aberdeen, answered the call of ' Lend me your aid,' and slowly but surely wafted the queues up the stairs, first a few from the left, and then a few from the right, while ' even the ranks of Aberdeen could scarce forbear to cheer.'

Once inside, the sheep were separated from the goats, and the ewes and the lambs were safely penned ; the committee was put in back seats in the balcony, as the acoustic properties of the hall were said to be there the best. Anyway, it enabled many to have a quiet nap, unobserved, albeit others seemed stricken with fits of coughing.

And what a panorama for British, colonial, and foreign scientists ! A huge silk curtain with varying rosy tints and others of all the colours of the rainbow, illustrated the perfection with which super cinemas now electrify their audiences until they are almost colour blind. Splodges of tangerine, elephant grey, victoria plum mauve, and other mysterious colours obtruded from all manner of hidden and unexpected angles. There were also lateral lightening effects.

Between the stage and the floor was an enormous grove of pink, artificial leaves of the beech, *Woolworthia aberdonensis*. If the pink had been a darker red, the description given by several of the visitors would have been correct!

### The Organ.

In the centre of these arose, like Persephone, between two small square pillars, the dozens of electric bell-pushes, apparently the original of ' Little man, you've had a busy day.' His head, hands and feet whisked about, and with every movement some new form of noise rended the air. Every possible variety, from the jingling and the tinkling of the bells, bells, bells ; the pathetic *vox humana* with its ' Darling, I am growing old,' to the thunder of the cannon which once sank a German submarine near the Bass Rock. All the while the little head of the little man, his coat and trousers, and the organ, constantly changed from red to blue, green to yellow and so forth, all to show what colours they had in Aberdeen. At long last the electrically-illuminated time-piece radiated 8-29, and the little man and his little organ sank into the bowels of the earth from which they had ascended. The applause, possibly misunderstood, was probably greater than he had ever known, and he showed his little face as he bowed.

### A Moving Picture.

Then at 8-30 the Great Curtain divided, the stage still and permanently

illuminated with shades of pinks and blues and yellows. There was revealed a ' moving picture ' indeed. The producer, stage manager, and scenic artist had designed a scene from Cleopatra. In the centre on a huge throne reclined the President, on one side the Lord Provost, and on the other the Principal of the University.

Behind these, the two Secretaries of the Association were ready in case the President fell, and on each side of these were five of one and four of the other. On either side of the throne were two ancient Egyptian tripods, transformed into holders of microphones, adjusted from time to time by the Secretaries.

The Aberdeen people welcomed the members, the President addressed them, and everybody sat and looked as though they listened. Then a delightful performance—in fact, the ' star turn '—a local celebrity gave some funny ' limericks.' And the members filed out to their patient Aberdonian audience, to give an exhibition of themselves. And on the morrow the members read all about what most of them did not hear the night before.

### Facilities.

The badge worn by a member gave free transport on the Aberdeen trams and buses, and as the evenings were long and the weather fine, advantage of this privilege was taken. This privilege was first given to the members at the Hull Meeting in 1922, and with one or two unexpected exceptions, has obtained ever since.

### Future Meeting.

The Association looks well ahead. In 1935 the meeting will be at Norwich, where late-comers will have a greater lodging problem than they had at Aberdeen ! In 1936 the Officers have accepted an invitation from Blackpool ; Nottingham in 1937 ; Cambridge in 1938 ; and Dundee in 1939 or 1940, a date in which will depend upon the possibility of an over-seas invitation for one of those years.

### Professor W. W. Watts.

Our readers will be pleased to hear that the well-known geologist Professor W. W. Watts, F.R.S., has accepted the invitation to preside at the Norwich Meeting. We referred to Professor Watts and his work in *The Naturalist* for August, 1932, p. 245.

### Conference of Delegates.

The Annual Conference of the Delegates from the Corresponding Societies of the British Association for the Advancement of Science was held at Aberdeen, Mr. T. Sheppard, M.Sc., of Hull, occupying the Chair. Colonel Sir Henry G. Lyons, D.Sc., F.R.S., late Director of the Science Museum at South Kensington, gave an address on ' Scientific Societies and Museums,' a subject which, oddly enough, was the title of an address by Mr. Sheppard over twenty years ago. Sir Henry referred to the help the national museums could give to the others in the provinces. Most of the important museums in London and the provinces were represented.

Mr. Sheppard called upon an old supporter of the Conference, Professor W. W. Watts, F.R.S., to propose a vote of thanks to Sir Henry, and on behalf of the delegates congratulated Professor Watts on his election as President of the British Association for next year.

Professor P. G. H. Boswell then read a paper on ' Town and Country Planning Schemes in relation to sites of Scientific Importance,' and Sir Albert Kitson spoke on the necessity of recording well-sinkings and borings for water. Interesting discussions followed.

### Presidential Addresses.

Besides the valuable ' journal ' and ' local programme,' the various

Presidential Addresses were available towards the end of the meeting, in the publication *The Advancement of Science*.[1] This includes the following :—

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| ' The New World-Picture of Modern Physics ' | Sir James H. Jeans. |
| ' Theories of Light ' ... ... ... ... | Prof. H. M. Macdonald. |
| ' Physical Methods in Chemistry ' ... ... | Prof. T. M. Lowry. |
| ' Plant Life and the Philosophy of Geology ' ... | Prof. W. T. Gordon. |
| ' The Study of Behaviour ' ... ... ... | Dr. E. S. Russell. |
| ' Co-operative Research in Geography ; with an African Example ' ... ... ... | Prof. A. G. Ogilvie. |
| ' The Future of Rail Transport ' ... ... | H. M. Hallsworth. |
| ' Sources of Cheap Electric Power ' ... ... | Prof. F. G. Baily. |
| ' The Use and Origin of Yerba Maté ' ... ... | Capt. T. A. Joyce. |
| ' Normal and Abnormal Colour Vision ' ... | Prof. H. E. Roaf. |
| ' Psychology and Social Problems ' ... ... | Dr. Shepherd Dawson. |
| ' Some Aspects of Forest Biology ' ... ... | Prof. A. W. Borthwick. |
| ' Science at the Universities : Some Problems of the Present and Future ' ... ... | H. T. Tizard. |
| ' Scientific Progress and Economic Planning in relation to Agriculture and Rural Life ' | Prof. J. A. S. Watson. |

### Papers.

There was probably a record in the number of papers and discussions which took place. Many were outside the scope of *The Naturalist*. The titles even of some would be a puzzle to any naturalist. In a supplementary programme we learned that Professor D. Katz gave a paper on ' Localisation of Sound by Dogs.'

### Cleveland Stones.

In place of Dr. Elgee, Mrs. Elgee read a paper to Section H on ' The Megalithic Cult of the Eastern Moorlands of Yorkshire.'

' In this region Megalithic structures comprise the following types : (1) Monoliths. (2) Rows or Alignments. (3) Parapets or Stockades. (4) Circles. (5) Ovals. (6) Triangles. They are associated with barrows and cairns, mostly of Mid-Bronze Age, and there is no evidence that any are earlier than the Early Bronze Age. The Triangles, or groups of three stones, are a type hitherto unrecognised. That Megaliths were fertility symbols is to be seen in the prevailing belief of the moorland farmers in the efficacy of rubbing-stones, and in the male and female stone gate-posts of their fields.'

The two speakers for this paper quite properly congratulated Dr. Elgee on the care in which he had made plans and photographs of the standing stones, but as to the explanations—or as one speaker put it, ' guesses '—that was a different matter, though he saw no harm in guessing ! From the photographs submitted it was clear that many of the lines of stones were put up to assist stage coaches, etc., in locating the roads when covered with snow—well-known features on the moors. In some cases the stones with ' bevels ' were clearly so shaped by the natural jointing of the sandstone, a feature particularly clear in the lintel over the fire-place, where other joints were parallel with the ' bevel.' It is difficult to gather why ordinary stone gate-posts, naturally in pairs, should be ' male and female,' and the fact that certain stones were in proximity to Bronze-Age barrows has no possible bearing upon their age or origin, any more than have the modern farmsteads, and whale jaws which sometimes occur there. Nor can we see any reason why an ordinary ' rubbing post ' put in a field by a farmer for the benefit of his cattle (God bless the Duke of Argyll !) should be looked upon as evidence of a belief in witchcraft and fertility.

[1] Published by the Association at 3/6.

### West Yorkshire Underground Water.

Prof. W. G. Fearnsides :—' The underground water problem as it affects the industrial regions of W. Yorkshire and the S.E. Pennine area is discussed. The importance of joints in the Carboniferous and older rocks for water storage within the formations, and for conducting unfiltered water to particular borings, shafts and wells, is stressed. The influence of rock composition and rock texture, more especially inter-grain porosity, on the water-bearing properties of the newer geological formations, is noted, and the author refers to the distribution of geological structures and their effects upon the disposition of wells and troublesome waters in the coal mines of the exposed coalfield area. Reference is made to the special precautions taken when sinking shafts through the Magnesian Limestone and Trias which lie above the Coal Measures in the concealed portion of the field that is now being developed. The composition of the water obtained from certain of the Bunter wells of the Midlands, more particularly those which must be increasingly exploited as the Doncaster coalfield and its industries expand, is discussed.'

### Microspores of Carboniferous Coals.

Dr. A. Raistrick :—' By the use of solvents, the microspores of coal-forming plants have been extracted from coal in quantities sufficient to allow of statistical treatment. Over forty different varieties of microspore are recognised, and an attempt has been made to study their distribution through the coal seams of both lower and upper Carboniferous age, in Northumberland and Durham. Their use for the correlation of coal seams has been tested over a wide area and a large number of seams, with encouraging results. Several problems of theoretical interest, relating to the coal-measure floras, are suggested by this study.'

### The Glacial Cause of Changing Climates.

Mr. M. B. Cotsworth :—' Since the present author's paper on changing climates at the meeting in 1906, so much more information concerning changes of climate has been gathered in Alaska, Canada, Western Asia, West Africa and other countries, that it seems advisable that the evidence of geologists, climatologists and government surveyors should be co-ordinated by a Research Committee appointed by the British Association to consider and report upon this world-wide subject, which has developed beyond the scope of individual research. Official photographs will be produced showing that great glaciers in Alaska have been melted back at the rate of about half a mile per year. The Sahara Desert has been drifting southwards across the Nigerian boundary. The Dead Sea has been dried up so far by evaporation that Jericho is now many miles north of the River Jordan's outfall into the Dead Sea. Palestine has become more arid, as have all the countries northward to the Siberian Railway. Similar changes are progressing in South Africa and Australia. From such indications the writer forms the opinion that the gravitational weight of the increasing Ice-cap in Greenland, Baffins Land, etc., indicates that the Glacial Period is continuous and that its variations during many thousands of years dry up vast areas while other parts are increasingly watered and renewed by the very slow but ever-varying changes of climate.'

### Fishing Intensity and Stock Replenishment in the Haddock.

Dr. D. S. Raitt :—' Investigations into the factors governing fecundity in North Sea haddock have shown that, in fish of the same age, egg production is proportional to a power of length slightly greater than the cube, while in fish of the same length the older the specimen the greater the number of eggs produced, the difference being most noticeable in two-year-olds as compared with three-year-olds. At the age of two, moreover,

only about 10 per cent. of the females and 60 per cent. of the males of a year class mature. At three about 75 per cent. of the females and 95 per cent. of the males are spawners, and it is not till the age of five in males and six in females that all surviving members of a brood have ripened. Such is the efficiency of the modern trawl that haddock come under its influence when they are about eighteen months old. Only a negligible percentage escapes capture to reach large size. The brunt of stock replenishment falls upon small fish of two and three years of age, for which task they are of greatly inferior capabilities.'

### Causes of Algal Abundance.

Dr. W. H. Pearsall :—' Algal abundance under natural conditions appears to be primarily related to the oxidation of organic matter in the water, and, indirectly, to floods which may increase the supply of products of oxidation. Examples from streams, lakes and laboratory cultures suggest, however, that algal abundance does not only depend on the presence of an adequate supply of certain dissolved salts. It appears also to depend upon the balance between certain nutritive materials such as, for example, the ratio between the concentrations of nitrates and phosphates or between the nitrogen supply and carbohydrate production. The anomaly apparently exists that a water may have adequate supplies of nutritive salts and yet a comparatively small algal flora.'

### Lead Dales of the Northern Pennines.

Mr. A. E. Smales :—' Lead-mining activity has given distinctive features to the dales of the Northern Pennines, between the Stainmore Saddle and the Tyne Corridor, in addition to the obvious imprint it has left upon the landscape. The miners have usually been small-scale farmers also, with the result that the pastoral dales farming is of a rather intensive type, with cattle-keeping on small-holdings a strongly marked feature. The generally high situation of the mines (due to geological factors), together with the dual occupation of the miner-farmer, have contributed to extend the zone of cultivation and settlement to remarkably high altitudes in these dales, and lead-mining has not obscured the dispersed pattern of the pastoral settlement. The decline in lead-mining since the 'seventies has been offset only to a small degree by development of production of associated minerals, and of quarrying. There has been a resultant large and general decrease in population, but these dales show a population " residue " from the lead-mining days.'

### Arrival of Celts in Scotland.

In the course of his address, Prof. V. Gordon Childe stated :—' A contingent of cognate people mixed with other elements from Yorkshire may have reinforced the Bronze Age population of the Lowlands and been responsible for the first settlements on Traprain Law and other hill-top towns. Their pottery is rather more closely allied to that from Heathery Burn Cave, Co. Durham, and Eston Nab, near Middlesbrough, than to the pure Scarborough Hallstatt, but such Hallstatt elements may be admitted. The transition to the Iron Age was gradual here. The parade objects from the Lowlands belong stylistically to the Arras school of Yorkshire and must have been the property of chieftains derived from the Parisii who settled there. Whether such chieftains led the Late Bronze Age contingent to Traprain Law or arrived later is still uncertain. La Tène Celts coming direct from the continent across the North Sea and landing round the mouth of the Tay and on the Moray Firth must be responsible for the erection of Gallic and vitrified forts which have no parallel in England. They introduced a fully-fledged iron industry and were the only people in Scotland to preserve the Celtic fashion of wearing safety-pins. They arrived with a culture still in the La Tène I stage and

therefore before 200 B.C. The Gallic forts and most vitrified forts (Duntroon, Dunagoil, Finavon) were abandoned before the Roman period.'

### Cytological Methods of Distinguishing *Salix alba* var. *cærulea* from closely Allied Species.

Dr. K. Blackburn and Mr. J. Wilkinson :—' Since great difficulty has been found on ordinary morphological grounds in distinguishing the true cricket-bat willow (*Salix alba* var. *cærulea*) from spurious forms, chiefly hybrids between *Salix alba* and *S. fragilis*, the possibility of using the chromosome characters is being explored. The root tip cells of *Salix alba, S. fragilis*, and crosses between these species, all show seventy-six chromosomes. These are all very small, but certain characteristic pairs found in *S. alba*, including the bat willows, are absent in *S. fragilis*. In undoubted hybrids the characteristic chromosomes occur singly. Other small differences help in distinguishing *S. alba* from *S. fragilis*. Typical *S. alba* differs from *S. alba* var. *cærulea* in having four instead of two chromosomes with satellites ; this is an uncertain character, since it is always possible for a satellite to be present but not visible. Since the major difficulty in the field seems to lie in distinguishing the *alba-fragilis* hybrids from the true bat willow, it is fortunate that it is just here that the chromosome studies afford most help.'

### Male Trees of *Salix alba* var. *cærulea*.

Dr. J. B. Davy :—' The opinion is widespread that there is no male of *Salix alba* var. *cærulea* Smith. Buyers of first-class bat-timber reject (or give a lower price for) trees known to be males, and growers do not knowingly plant male " setts." In East Anglia the writer has found staminate trees which clearly belong to this variety, having similar characters of inflorescence, leaf, bark and branching. Smith did not himself say that the staminate sex was unknown, and in 1829 a male specimen was figured in *Salictum Woburnense*, a book produced by the authority of the Duke of Bedford, who was in close touch with Smith, by whom probably the plates were seen. No evidence has been produced, as far as we are aware, to indicate that good or bad quality of timber is associated with sex ; it is certain that bat-willow timber of poor quality is obtained from both female and male trees, but we lack evidence as to the quality of timber produced by well-grown male trees. This is an important point, for several of the phenomenally vigorous seedlings being grown from seed obtained by the author in 1932 prove to be males.'

### Vessel Differentiation in Angiosperms.

Prof. J. H. Priestley :—' The " strip method " of studying cambial activity makes it possible to follow the course of one individual vessel for a comparatively long distance in microscopic preparations. A study of vessel differentiation by this method directs attention to the rapidity of expansion of the vessel segments and of the perforation of the more or less transverse cross walls. These processes take place when the wall of the future vessel is very thin. Vessel segments have been separated by maceration in this stage, as extremely thin-walled elements without signs of pitting. By plasmolysis under suitable conditions it has been possible to show the presence of protoplasts in the segments of the vessels, after expansion and after the cross walls are perforated. In many vessels sheets of pectin are present, across the region of perforation, after the cellulose cross walls have perforated. The study of vessel differentiation and vessel structure continues to emphasise the distinction between ring porous and diffuse porous hardwood types.'

### Reproductive Organs of Fossil Ginkgoales.

Prof. T. M. Harris :—' The only reproductive organs which have been

referred to the fossil Ginkgoales are a few resembling those of *Ginkgo biloba*, and none of these has been investigated in detail. Comparison of the cuticles of all the isolated fructifications and leaves in the lower Jurassic flora of Greenland has, however, provided reasons for referring to the Ginkgoales certain reproductive organs which differ greatly from those of *G. biloba*; among the male organs *Bernettia*, hitherto regarded as the female cone of a Cycad, and *Leptostrobus*, hitherto regarded as the female cone of a conifer; among female organs *Staphidiophora*, a new genus with the appearance of a bunch of currents. The bearing of these fossils on Gymnosperm morphology is discussed.'

### Peats and Peaty Soils.

Dr. D. K. Fraser :—' True peat soils in Britain belong to two main groups : (1) Topographical or Basin Peats, which develop in areas of high ground water or of free stagnant water; (2) Climatic Peats, which are alpine in Britain as a whole but form the normal soils under the high rainfall of the north and west of Scotland, the organic soil forming above not only high ground water profiles such as gley, but also on drier profiles such as sand podsols. In Scotland, the climax vegetation of these types is characterised by a mixture of *Scirpus cæspitosus* and *Calluna vulgaris*, with a moss layer in which the *Sphagna Acutifolia* group predominates. This climax is reached in the east of Scotland as a rule only on ancient peats of early post-glacial origin, but under the high rainfall of the west it develops on moderately shallow peat of recent origin. Although very poor in available nutrients, the chief disability of these peats is insufficient aeration. The peat of the west of Scotland is less tractable than that of the east, since it is more highly dispersed and more plastic, and therefore less easily drained and less easily penetrated by manures. It therefore requires either very intense or very prolonged measures of amelioration for its improvement.'

### Sites of Scientific Importance.

Prof. P. G. H. Boswell :—' Under the Town and Country Planning Act, 1932, a local authority or joint committee must obtain the approval of the Minister of Health to a resolution deciding to prepare a scheme. Among the objects of such a planning scheme, as cited in Section 1 of the Act, are " preserving existing buildings or other objects of architectural, historic, and artistic interest and places of natural interest or beauty, and generally of protecting existing amenities whether in urban or rural portions of the area." Arrangements have now been made under which the Ministry of Health is systematically notifying the British Association of the areas in which planning schemes are proposed. The Association is well fitted by its aims and constitution, and by its liaison with its Corresponding Societies, to make representations when necessary to the Ministry and to appropriate local authorities or joint committees for the preservation of sites or objects of exceptional scientific interest—botanical, zoological, geological, birthplaces or domiciles of scientific worthies, and so forth. Obviously, the Association must rely largely on its Corresponding Societies for information as to sites or objects which may be endangered. Suggestions are therefore invited from the Delegates as to the best method of procedure for obtaining information as to sites, etc., which should be preserved.'

### Recording Well-sinkings and Borings.

Sir Albert E. Kitson :—' The supply of information respecting the nature of strata found during boring operations, and the bearing of such on water supplies, is admittedly highly desirable. But registration of such information is not legally compulsory. Boring operations for water afford excellent opportunities to obtain this information, and it is advisable

to do so. It has been urged that people actually operating the boring plants are not geologists, and so cannot give particulars of value. This is erroneous ; they can give the main results, leaving the details of strata to be supplied by geologists. The Geological Survey of Great Britain has done and is doing most valuable work in this as in all other sections of geology and can supplement such information. The numerous activities of this and other kinds in this country, as for instance those of the recent drought, afford good opportunities in this direction, but it is only possible for the Geological Survey to arrange for visits to boring operations if informed of them. There are, besides, large numbers of devoted non-professional geologists, widely dispersed throughout this country, who can safely be depended upon to assist in the matter. Further, the members of Corresponding Societies can also assist by notifying the Geological Survey of any such operations in their districts. Co-operation and co-ordination in this manner will give valuable information—at present only obtainable in some cases—and be of great economic value to us.'

T. Sheppard.

## BOOK REVIEW.

**Economic Advisory Council ; Committee on Locust Control,** Sixth Report, 1934, Price 1s., postage extra. Obtainable from H.M. Stationery Office or through any Bookseller. This report is a review of the present locust outbreak in Africa and Western Asia and of the investigations carried out since 1929, and a note on the general programme of further investigations. In 1929 arrangements were made for the Imperial Institute of Entomology to undertake the collection, collation, and dissemination of information regarding the breeding and migration of the Desert Locust. The funds were provided by the Empire Marketing Board. In 1931 the scope was extended to include all tropical African locusts. The Desert Locust (*Schistocera gregaria*).—The first signs of the beginning of a new swarming period were observed early in 1926 on the Red Sea coast of the Sudan, in the Algerian Sahara, and in Baluchistan. During the following winter the outbreak had spread to the Persian Gulf and in India. In the spring of 1927 it had spread to Afghanistan and as far as Bengal and Assam. In 1927-28 season saw the beginning of locust activities in West Africa. In the summer of 1928 further serious developments occurred in Kenya, Tanganyika Territory, and Uganda, and also a northern spread to Transjordan, Palestine, and Egypt. In 1928-29 there was extensive development in East Africa and Asia. Late in 1929 large swarms invaded Morocco, Algeria, Tunisia, and Tripolitania, reaching the Mediterranean. In 1930-31 the outbreak decreased in extent and intensity and improvement was maintained in 1931-32. During the winter of 1932-33 a serious new invasion of Morocco occurred. The immediate prospects with regard to the Desert Locust are hopeful in East Africa and Asia, and the outbreak is substantially at an end, but the situation in North-west Africa is still serious. The Tropical Migratory Locust (*Locusta migratoria migratorioides*).—The earliest records of the present outbreak are from the French Sudan in June and July, 1928. In 1929-30 the whole of West Africa to Lake Chad was overrun by swarms, which increased. In May, 1930, was a migration in an easterly direction on an enormous scale into French Equatorial Africa and the Sudan. There has since been a gradual improvement in West Africa, but spread in the East which became exceedingly serious in Rhodesia, Nyasaland, Bechuanaland, and South-west Africa. In 1932 the situation in East Africa was extremely grave, but the outbreak is expected to die down within the next year. The Red Locust (*Nomadacris septemfasciata*).—Swarms of this species were not a menace until 1930, when they appeared

in Northern Rhodesia. The fifth generation invaded the Belgian Congo and Bechuanaland, and the sixth invaded the Union of South Africa. In 1932-33 it was breeding on an enormous scale and areas of infestation were extended, and in 1933 it spread more widely into Tanganyika Territory, Uganda, and Kenya by flying swarms. There is definite reason for anticipating a further increase to the north and the immediate outlook is most menacing. The report continues with a survey of anti-locust investigation carried out in recent years in British and foreign territories and the results achieved through centralisation of information have fully justified that policy. A general programme is given of further investigations and the possibility of employing clouds of finely divided poison dust (*Sodium arsenite*) discharged from aircraft for the destruction of flying locusts is considered. Death of the locust is mainly due to penetration of the integument by the poison. A summary of scientific results so far achieved shows that very little was known about the Desert Locust when the present investigations started. There are, normally, two broods in the year, one arising during the summer rains in the deserts south of the Sahara, which the following autumn and winter migrates into North Africa and produces a second generation. The Red Locust was regarded as a South African species, but has been found to originate in Northern Rhodesia. The chief lesson of the last few years is that it is impossible to control a locust outbreak once it has been allowed to spread over a large area. The losses in the present outbreak are given as at least seven million pounds. Each species of locust when breeding is restricted to a vegetational zone of definite type and the migrational swarms are regulated by seasonal climatic changes. The report concludes with a note on *Empusa grylli* Fresenius, the fungus disease of locusts, but attempts at cultivation have so far proved unsuccessful and its possible utilisation as a means of locust control is at present problematical.

## CORRESPONDENCE.

The Editors of *The Naturalist.*

Dear Sirs,

With reference to Mr. Tomlinson's note in *The Naturalist* for July, on the age of the first flowering of a horse-chestnut tree, I imagine that many young trees have been brought into first flowering by the sunshine of 1933, which has been followed by the profuse blossoming we have seen this year in so many trees. I have in my garden at Shipley, two trees, one a sycamore and the other an ash, which flowered for the first time this year. Both were three years old when transplanted in 1920, and are therefore now seventeen years old in the year of their first flowering.

A. Malins Smith

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The *Vasculum* for August, contains ' Redstarts and Pied Flycatchers,' by A. Noble ; ' Explosive Fruits,' by Dr. K. B. Blackburn ; ' A Durham Hybrid between *Rosa pimpinellifolia* and *R. mollis*,' by Ethel Bolton, and ' Notes on the Flora of Upper Teesdale,' by G. W. Temperley, in which attention is drawn to the harmful effects of sheep grazing on this special flora. Of Entomological interest are ' Some Spiders of a Northern Garden,' by J. E. Hull, and ' Three Notable Days,' by Professor J. W. Heslop Harrison and J. R. Johnson. G. F. Courtenay contributes supplementary notes on the birds round Sunderland.

*The Naturalist*

# YORKSHIRE NATURALISTS AT FLAMBOROUGH.

We were unfortunate on July 14th on this Excursion for after leaving Bridlington in sunshine we found the Head enveloped in a wet sea fog with the fog horn continually booming from the lighthouse. The party split up and the various sections appeared small in numbers but the attendance at the tea table and meeting was quite good and must have been above thirty.

The meal provided was a new type for our Union Meetings, a Crab tea. Flamborough seems to rely on the Crab to reward its fishermen in a great measure and quantities are dispatched daily to London.

**Botany** (Mr. T. Stainforth writes) : The Botanical Section took the beach route from the Sewerby Café steps to Danes Dyke, and the cliff top from Danes Dyke to South Landing. The first part of the journey afforded opportunity for observation of plants growing on the chalk cliff crevices. The following species were noted in this habitat :— *Funaria officinalis, Cochlearia officinalis* (traces of plant in fruit), *Diplotaxis muralis, Reseda Luteola, Silene Cucubalus, Ononis repens, Melilotus officinalis, Anthyllis Vulneraria, Lotus corniculatus, Daucus Carota, Centaurea Scabiosa, Sonchus oleraceus, Atriplex littoralis, Festuca elatior.*

The rough clayey and sandy slopes composed of morainic deposits that form the upper part of the cliffs between Danes Dyke and South Landing were rich in plant life, and are worthy of closer investigation than the party was able to give it. The sandy slopes of Beacon Hill were of particular interest. Here grew in abundance *Hyoscyamus niger, Erodium cicutarium, Sedum acre, Arenaria serpyllifolia* and *Filago germanica* with occasional *Verbascum Thapsus, Lycopsis arvensis* and *Echium vulgare.*

On the less sandy slopes the dominant plants in flower were the composites *Carduus nutans, Carlina vulgaris, Cnicus lanceolatus, Cnicus arvensis, Eupatorium cannabinum, Pulicaria dysenterica, Achillea Millefolium* (white to rich pink), *Senecio Jacobaea, Arctium majus, Centaurea nigra, C. Scabiosa, Sonchus oleraceus, Tragopogon pratense* (in fruit), *Crepis capillaris* (virens) and *Leontodon hispidus. Dancus Carota, Pimpinella Saxifraga, Potentilla reptans, Agrimonia Eupatoria, Erythræa Centaurium, Thymus Serpyllum, Campanula rotundifolia, Festuca elatior, Agrostis palustris, Dactylis glomerata,* and *Festuca ovina* were also common. The only orchid noted was *Orchis maculata.*

On the wetter parts of the cliffs were beds of *Equisetum maximum* growing well above the heads of the botanists who walked among them. *Phragmites communis* also occurred in similar conditions. *Galium verum,* although common enough, was limited almost exclusively to the cliff top, by the side of the path. Here also grew *Plantago Coronopus* and a dwarf form of *Phleum pratense.*

Mr. C. W. Mason writes : The Vertebrate Section had very little luck. A heavy mist or ' sea rork ' as this is called in these parts (I am not sure about the spelling as this is a dialect word), hung over the cliffs with increasing intensity apparently culminating at Speeton, where it was so heavy that there was no visibility beyond about two yards, and all the vegetation, which this year is abnormally high, was dripping. Rabbits were numerous along the clay cliffs.

Mr. C. F. Procter followed out the programme, but had no luck at the Speeton end. He was wet through in a very short time. The cliffs are bad going at Speeton, but he eventually picked up with the Vertebrate Section proper at Bempton. At various points on the route he had heard of plenty of birds but had seen none. At this point however, Mr. H. B. Booth with a number of friends from the West Riding had had

a little better luck. Many Guillemots were observed sitting, and in one or two cases young were noted. Great numbers of Kittiwakes with young, and a fair sprinkling of Puffins and Razor-bills, numbers of Herring Gulls, a few Jackdaws, many Pigeons, Rock Pipits and one Fulmar Petrel. A fair sprinkling of Carrion Crows were also in evidence.

At the evening meeting, Mr. Procter, Mr. Booth, and Mr. Bartley of Sewerby reported, and Mr. Bartley, as a resident and bird observer, gave some very interesting information. He stated that the Fulmar could be seen almost any time between the North Landing and Sewerby, and the Botanists who had travelled that route verified this.

It was a very bad day for observation but there was an impression that the Herring Gulls and Kittiwakes were increasing out of their proportion, and that the Guillemots were steadily decreasing.

**Diptera** (Chris. A. Cheetham writes) : Flies were fairly plentiful on the washed up seaweeds but they appear to have been made up of three species *Fucellia fucorum* Fal., *Limosina zosteræ* Hal. and *Tichomyza fusca* Meg. The damp mist made the vegetation too moist for sweeping, on the flowers of the Nodding Thistle a striking Syrphid, *Catabomba pyrastri* L. was taken and also *Eristalis tenax* L., *E. arbustorum* L. and *Pachyrrhina maculata* Mg.

**Lepidoptera** (Mr. T. Stainforth, Hull) writes : The cliff slopes on the headland between Danes Dyke and South Landing were luxuriant with flowers, but owing to the absence of sunshine the number of insects observed in flight was not great. The Narrow-bordered Five-spot Burnet Moth (*Zygaena lonicerae*) was common either at rest on flowers of Knapweeds, Thistles, Spotted Orchids, etc., or flying sluggishly in utter indifference to capture. As would be expected the examples visiting orchid flowers showed pairs of pollinia adhering to their proboscides and eyes.

Among the Butterflies observed were the Small Heath and Meadow Brown, both common, and the Ringlet (*Aphantopus hyperanthus*), of which about a dozen were seen. A few Small Tortoiseshells, evidently freshly emerged, and males of the Common Blue were also noticed. Silver-Y Moths as elsewhere this year were abundant.

The most interesting species to record, however, is the Humming Bird Hawk Moth (*Macroglossa stellatarum*) about half-a-dozen of which were seen darting rapidly from head to head of the Musk Thistle (*Carduus nutans*) which they preferred apparently to the other floral dainties provided. An example of the moth was captured by the President who turned entomologist for the nonce.

Several members availed themselves of the opportunity of watching closely the habits of this remarkable migrant moth. It was possible to observe the creature at a distance of a few feet by careful approach and the long uncoiled proboscis could then easily be seen to be inserted and withdrawn successively into and out of the Thistle florets. All the while the moth hovered with rapidly vibrating wings above the flower head. Then, having exhausted the nectar, or being desirous of change, it darted like a flash to other feasting ground. There had undoubtedly been an immigration of the species shortly before the date of the Excursion. The Yellow Bedstraw, the favourite food-plant of the caterpillar, is abundant on this South side of Flamborough Head, and by searching it in a few weeks' time it will doubtless be possible to find the larvæ.[1]

[1] Since this note was drafted out I have had opportunity of visiting the locality again, and on the cliff-top at Beacon Hill my daughter and I counted more than twenty of the caterpillars then (August 8th) almost full-fed. The larvæ were also common on Spurn Point (August 6th).

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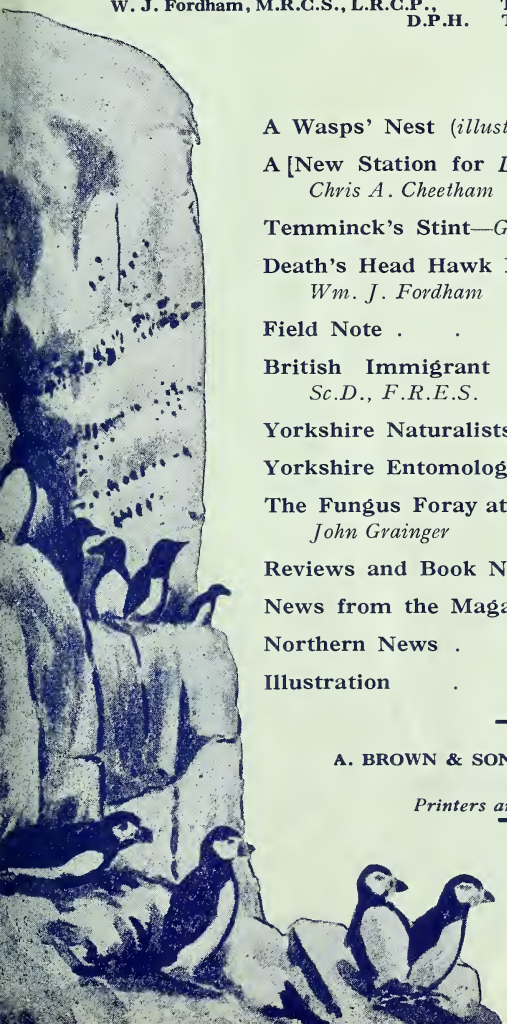

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### FRESHWATER BIOLOGY SECTION.

THE Annual Meeting will be held on Saturday, 17th November, 1934, at 3 p.m. in Room 29, The University, Leeds. Entrance by the Baines Door.

After the usual business the following papers will be read :—

'*Chrysopyxis globosa*,' by A. Malins-Smith.

'Some observations on the fauna of wet rocks,' by H. Whitehead.

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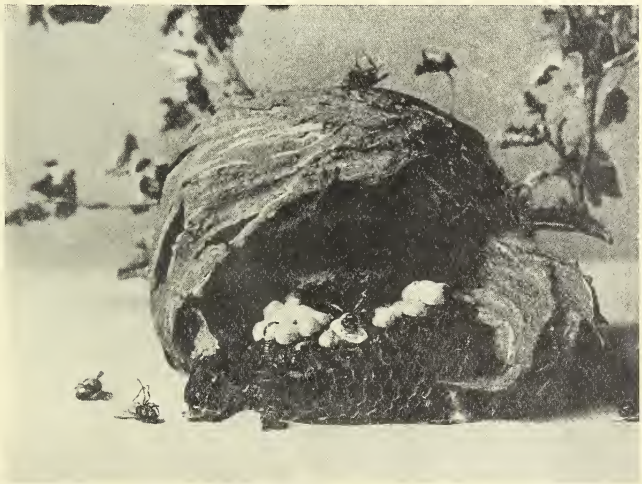
## A WASPS' NEST.

In *Ours*, the magazine of Messrs. Reckitt and Sons, of Hull, for September, is an article on 'Wopses.' From this we

**A Wasps' Nest, attached to some twigs, found by one of the Directors. The size can be gauged from the two wasps lying near it.**



**The interior of a Wasps' Nest, showing the honeycomb pattern. A large nest may contain thousands of these cells, each capable of holding a wasp.**

learn :—'The nest of a colony of wasps is ingeniously made. It is constructed of small fibres of old wood, which the wasps

knead, with the aid of their saliva, into a pulp, which can be easily moulded whilst moist. It dries into a substance of a papery appearance (the one photographed was almost like tissue paper), but possessing considerable tenacity. Inside, the combs, which are arranged horizontally and contain layers of cells, are suspended one from the other by a number of hanging pillars, there being just sufficient space between two combs to allow the wasps to cross each other. The nest is increased in size as occasion requires. In a favourable season, when the weather is warm and food plentiful, a nest may contain many thousands of cells full of wasps in various stages of development. There were some hundreds of cells in the nest which caused this article to be written, so we imagine a great service to fruit growers—and to picnic parties !—was performed by the destroyer of the nest. A good word can be said for the insect, however, as it reduces the caterpillar population—so the picnickers can take their choice—wasps or caterpillars ! '

We are indebted to the photographer, Mr. C. W. Rodmell, and the Editor of *Ours* for the two illustrations reproduced herewith.

---

## A NEW STATION FOR *DICRANOMYIA APERTA* WAHLR.

CHRIS. A. CHEETHAM.

THIS Limnobid was first recorded as a British insect in *The Naturalist*, 1927, p. 325, and its habitat and date of occurrence were described on p. 402, 1930. I have noted it yearly at this place, but it has not been found anywhere else in the country. Whilst with the Mycological Section in Beezley Glen, Ingleton, on September 15th, I noticed a small area that was covered by the same type of plants as are found at Austwick where *D. aperta* occurs, the principal plant being *Schœnas nigricans* with flowers of *Parnassia palustris* here and there. On these flowers I found the fly just as I am used to seeing it at Austwick. *Parnassia* is plentiful in many places, but I have not found the *Dicranomyia* on it elsewhere ; nor yet have I found the insect on flowers of other plants like *Scabiosa succisa* or *Leontodon autumnalis* which are often present with *Schœnas* both here and elsewhere, I am inclined to think that the leaf bases and roots of the *Schœnas* are probably the habitat of the insect in the larval state when the plant is growing with a tufted habit on a damp hill slope.

# TEMMINCK'S STINT.

GEORGE BOLAM.

With reference to the announcement in the September issue of *The Naturalist* of the finding of a nest of this bird in Scotland during the past summer, it may be of interest to note that *Tringa temmincki* has been steadily, if slowly, extending its breeding range southwards in Norway for some years past. My friend, Dr. Hugh Blair, tells me that it nested three years ago about Christiansund, and has this year been found breeding, in some numbers, as far south as Bergen, which is in about the same latitude as Shetland. So that, although it has hitherto been recorded as only a somewhat irregular visitor on migration to the British Isles, it need not cause any very great surprise should the 1934 nest prove to be but the prelude of a regular colonisation of the Highlands.

In Lapland we used to find its nests in a variety of situations, from high up upon the hills to within a few yards of tide-mark upon the sea-shore. In the hayfields round human settlements (where I have sometimes found as many as half a dozen in the course of an afternoon) the nest usually bears considerable resemblance to that of a Skylark, being neatly constructed of fine grass, and measuring less than 3 in. across by nearly as much in depth. About the shores of sea or lake, it may sometimes be almost clear of vegetation, sheltered, perhaps, by a dwarf-willow and lined with little else than the leaves of that shrub : while on a fell-top it may be no more than a scrape amongst reindeer-moss or crowberry with little or no attempt at architecture.

Especially in exposed situations, the bird may leave its nest while an intruder is yet thirty or forty yards away and fly right off, not to return, perhaps, for half an hour. In other cases she will sit quite close and rise at one's feet. When the young are hatched, both parents are very demonstrative, and will run about within a yard or two of one's feet with a low, querulous cry as though lisping for mercy. Should the chicks be very young, and one remains still for a few minutes, one may soon have each parent brooding chicks within a yard of one's feet. The tiny creatures are of somewhat Dunlin type, except that the down on the upper parts is dark olive-green, with back markings, in place of being brown, thickly spangled over with light grey as though dusted with specks of grey lichen. The under-down is pale buff, with a darker buff band across the chest. Legs, dull slate with a tinge of olive ; bill, dark horn-colour, scarcely quarter of an inch long.

Temminck's Stint has often been likened to a miniature

Common Sandpiper, as a means of distinguishing it from the Little Stint, which is more like a diminutive Dunlin ; but although this is quite good up to a certain point in autumn or winter, the comparison is not so helpful when applied to the birds in their summer haunts. In size they are much alike, while in actions and habits they are both typical Stints, not Sandpipers. The Little Stint is, of course, much ruddier in plumage than Temminck's, but the latter has still a good deal more of rusty edgings to some of the feathers on the upper parts than it is often given credit for, this feature being more pronounced in some individuals than in others. In flight, the two white outer tail-feathers in Temminck s Stint are generally conspicuous enough as an aid to identification ; while its buffish-yellow legs are a good distinction upon the ground, the legs of the Little Stint being black.

The eggs of Temminck's Stint do not vary very much, the typical ground-colour running from greyish-white to buff, but there is usually a greenish tinge ; nearly always there are undermarkings of lilac-grey and ash-colour beneath the small yellow-brown or chocolate spots. In some clutches I saw, however, the markings were so large and sparsely distributed that the eggs might pretty easily have been mistaken for those of the Little Stint. In one nest, both ground-colour and blotches were of such a dark olive-brown that the eggs bore a striking resemblance to miniature Curlew's eggs.

The aerial evolutions of Temminck's Stints, on the breeding-grounds, are a treat to watch, being so varied and attractive ; they are also diagnostic. Half a dozen or more of the birds will sometimes go flitting round together, light on the wing as Sand-Martins, for which at first glance I have mistaken them. Anon, one will detach itself from the party to hover for a moment almost like a tiny Kestrel, or to go off at a tangent with the swift and twisting flight characteristic of most of the family of Waders. During courtship, both sexes may be seen indulging together in a most fascinating butterfly-like circuition, at no great height in the air, the male venting his ecstasy in a weak but pleasing song, somewhat reminiscent of the trill of a Dunlin, but differing from it in that, in place of a steady rise in cadence, it softly rises and falls three or four times before coming to a finish. With stiff and motionless wings held high above his back he then planes slowly down to earth, reminding one very much of a Red Admiral or other large butterfly. The trill may be continued from the summit of a stone or hummock, or even from a post should one happen to be handy ; or the minstrel may recover his flight and mount again into the air to resume his singing on the wing. I have even seen him alight on the

flower-bespangled roof of an inhabited human dwelling and finish his song there, his nest and eggs being afterwards found in a bed of *Cornus suecica* within ten yards of the door of the shieling into which I had just seen two women, several children, and a savagely barking dog retire ! Laplanders are invariably kind to all birds which visit their lonely settlements, albeit they are not above profiting by the quileless simplicity with which the Golden-eye Duck lays her eggs in the commodious nesting-boxes put up for her convenience round their dwellings ; thereby furnishing them with a limited number of eggs for the breakfast-table to eke out the scant diet of fish from the lake, which is the ordinary fare of these human inhabitants of the wilds.

[We regret to announce that Mr. George Bolam passed away suddenly, but very peacefully on the night of October 25th, at Alston.]—H.B.B.

## DEATH'S HEAD HAWK MOTH IN EAST YORKSHIRE.

WM. J. FORDHAM.

I SEE in the *Hull Times* of October 6th that a specimen of this moth has been taken at Bridlington by Mr. Catchpole. The insect measured over five inches across the wings and emitted the characteristic ' squeak ' when captured. A number of the larvæ have been found in Bridlington during the summer. Within the last few days I have had brought to me two pupæ of this moth found at Barmby Moor by farm workers during potato digging operations.

## FIELD NOTE.

**Cumberland Parasitic Hymenoptera.**—This note is a continuation of that which appeared on p. 205 anté. PIMPLINÆ.—*Pimpla turionella* Linn., Orton, 7.6.26. *Lissonota bellator* Grav., Kelsick, 13.9.24. Both fairly common flies. TRYPHONINÆ.—*Homocidus pectoratorius* Grav., Kelsick, 11.6.24, a ♀. *Polyblastus pastoralis* Grav., Kelsick, 17.6.25, also a ♀. *Prionopoda stictica* Fab., Dundraw, 3.7.25, a ♂ *P. glabra* Bridgm., Orton, 7.6.26. OPHIONINÆ.—*Omorga faunus* Grav., Kelsick, 11.6.24, a ♂. in a window. *Phobocampa obscurella* Holmg., Oulton Moss, 5.9.25. *Thersilochus jocator* Fab., Longtown, 4.9.29. and at Easton, 25.6.29 in the same district.—JAS. MURRAY, Gretna.

## NORTHERN NEWS.

In referring to the exceptionally low spring tides, the local press records ' A bed of rock 500 yards long, known by local fishermen as Novia Scotia, jutting out of the sea,' has been exposed at Withernsea. Nova Scotia is a sand bank shown on Admiralty charts, but the bed of rock proves to be the usual heap of rounded boulders known as the ' Skerries,' which of course were exposed rather more than usual.

# BRITISH IMMIGRANT INSECTS.

C. B. WILLIAMS, SC.D., F.R.E.S.

Presidential Address to the Zoological Section of the South Eastern Union of Scientific Societies.

(Reprinted from the *Transactions*.)

THE subject of insect immigration is receiving increasing attention nowadays and the present address is an interesting survey of the subject. Mass movement of butterflies from one locality to another is by no means a rare event and has been studied recently by the Insect Immigration Committee of the S.E.U. of S.S. (Secretary : Capt. T. Dannreuther, R.N.) Migration is a deliberate change of locality or habitat and Great Britain is the end point for many migrations. Most immigrants arrive in the spring or early summer but the Camberwell Beauty and Monarch butterflies are autumnal.

The Monarch or Black-veined Brown butterfly (*Danaus plexippus* L.) is normally found in N. and S. America, the larva feeding on Milk Weed (*Asclepias*). At intervals odd specimens turn up in Europe in the autumn, usually on the S.W. coast of England. In 1933 over thirty specimens were seen, nearly all on the South coast but also odd examples in Northampton, Lancashire, and Durham.

The Cabbage White butterflies (*Pieris brassicæ* L., *P. rapæ* L., and more rarely *P. napi* L.) exhibit movements much more commonly than was suspected and they may occur at intervals throughout the year.

The Painted Lady (*Vanessa cardui* L.) is one of the best known migrants, probably originating in Northern Africa, and reaching our shores during May. A huge migration of this species occurred in 1879 which overran Western Europe. In 1903 there was another great immigration.

The Clouded Yellow (*Colias croceus* Fourc.) has been known as an immigrant to this country for over a hundred years, and it is doubtful if it ever survives the winter here in any stage. No large immigration has been recorded during the past two years.

The Red Admiral (*Vanessa atalanta* L.) is a common migrant frequently observed at Buddleia blossoms in large numbers. Evidence obtained strongly supports the idea of a return flight.

Dr. Williams draws attention to the interesting records obtained by Capt. Dannreuther from the lighthouses and light vessels round the coast and concludes his address with a summary of 1933 records and detailed records of the occurrence of the Monarch butterfly in the British Isles in 1933.

More information on insect migration can be obtained from a paper by Capt. Dannreuther in the pages of the *Entomologist* for August, 1934 and another in the *Entomologist's Monthly Magazine* for the same month. Any entomologist who wishes to co-operate with the work of the insect Immigration Committee of the S.E.U.S.S. should apply to the recorder of the Yorkshire Naturalists' Union on that Committee, Mr. W. D. Hincks, of 46 Gipton Wood Avenue, Harehills, Leeds, 8.

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An illustrated account of ' The Farndale Water Supply,' by T. H. Jones, appears in the *Journal of the Hull Association of Engineers*, just published.

*The Museums Journal* for July contains Dr. Cyril Fox's Presidential Address on ' Open-air Museums,' read at the Bristol Conference of the Museums Association. The August number of the same journal contains a paper on ' Folk Museums,' by Dr. R. E. Mortimer Wheeler, and the September number notes on the same subject, by Mr. T. Shepperd.

# YORKSHIRE NATURALISTS AT GOOLE.

Goole is a long way from the rest of the vice-county, V.C. 63, and for many years it has been neglected by the Yorkshire Naturalists' Union. This was not the case in the early days of the Union, for then Dr. H. F. Parsons lived at Goole and Dr. F. A. Lees was near at hand in Lincolnshire ; these and other enthusiastic naturalists, members of the Goole Scientific Society, were keen supporters of the Union, and many interesting circulars are to be found in the *Transactions* and also reports of meetings in *The Naturalist* for 1877, 1881, and 1882.

The old minute books of the Goole Society are still in existence, and a desire to see how the many interesting records in these stand to-day decided the selection of Goole as our August meeting place.

Perhaps the two hot summers we have had have dried up the damp areas of Rawcliffe rabbit hills, for we found no ponds nor many of the plants that were found there in those early days ; this locality is still worth attention at an earlier date and in a more normal year.

Monday was, unfortunately, a very wet day, and the success of our visit to the Ousefleet corner suffered in consequence, as did the attendance on a date and place that would otherwise have attracted members from the east of the county.

We were fortunate in having a good guide, Mr. A. E. Greaves, whilst the many other willing helpers seemed to suggest that perhaps the dark days of the Goole Society have passed away, and that natural history may again have a strong hold in this eastern corner of our county.

**Botany** (A. Malins Smith) : Saturday was spent mainly at Rawcliffe ' Rabbit Hills,' an area from which Dr. H. F. Parsons recorded a few rare species about sixty years ago. A good deal of tipping has gone on in the area, both of potato tops from the fields round and of general rubbish in the centre. Already, as Lees' flora records, T. Birks in 1878 found *Limosella aquatica* to be quite extinguished by potato tops, although Dr. Parsons had recorded it only the year before. It is not surprising in the circumstances, that none of the five uncommon species given by Dr. Sledge for the ' Rabbit Hills ' in Circular No. 385 was found. Special search was made for *Gentiana pneumonanthe*, which had been seen by local botanists up to about 1914 and for which the habitat still seemed suitable. The search was, however, without success, though only repeated search can show whether the plant is finally gone from this locality.

Apart from this floristic aspect, the ecology of the area was interesting. The soil is of an acid character, which for some reason, probably the formation of a pan, usually holds water in numerous hollows. Either because of the occurrence of two dry summers in succession, or because the area is gradually becoming drier, there was no water in any of these hollows at the time of our visit.

In accordance with expectation in such conditions the drier raised ground produced a woodland of the oak-birch type, among which were many planted conifers. Gorse was common in the undergrowth, and the ground vegetation included the foxglove, the harebell, and abundance of *Aira flexuosa*. An interesting point about the woodland was that seedlings were numerous, those of oak, birch, and gorse being common, while foxglove seedlings were very abundant. Thus the wood is capable of regeneration should the main tree-canopy be felled. This supplies an illustration of one of Dr. Pearsall's main contentions in a recent number of *The Naturalist* that regeneration can go on perfectly well in acid soil conditions if other circumstances are favourable. Of these other conditions he instances animal attack as the chief destructive agency. From the name ' Rabbit Hills ' one would have expected

rabbit attack to have been heavy, but as far as my observations went the rabbit was almost absent, and, if there really are very few, the commonness of the seedlings may be accounted for.

The marshy hollows were frequent but small, and the largest one is now, whatever it may have been formerly, completely occupied by a rush and sedge vegetation with *Juncus communis, J. articulatus,* and *Carex Goodenowii* as the chief species. On the somewhat dried ground at one end of this *Erica tetralix* was common. Other hollows held such characteristic plants as *Hydrocotyle vulgaris, Achillea ptarmica, Mentha arvensis, Galium palustre* and *Viola palustris,* with occasional *Lysimachia vulgaris.* On the roadside were noted *Erodium cicutarium, Vicia hirsuta,* and much *Epilobium augustifolium.*

Part of the day was spent in gravel quarries near the Goole pumping-station and in the cornfields ; here were the usual weeds of a light arable soil needing lime, among which corn spurrey was the most abundant and characteristic.

Dr. John Grainger adds : None of the old records for the ' Rabbit Hills ' seem to have been confirmed, but *Polygonum lapathifolium,* a somewhat uncommon weed of arable land, was found by Mr. Mason.

Goole Moor yielded large quantities of *Andromeda polifolia* and *Myrica Gale,* whilst the surrounding ditches grew surprising quantities of *Alisma Plantago. Oenanthe fistulosa* was also found.

*Allium scorodoprasum* and *A. schoenoprasum* were obtained from the south bank of the Ouse, and *Caucalis nodosa* occurred on the north bank of the drain to the Trent, which was visited on the Monday afternoon.

The banks of the Ouse at Ousefleet were in process of colonisation by a series of mud-inhabiting plants. Warping was practised on the margin of the channel, in order to raise the level of the mud flats. The mud was first colonised by *Glyceria maritima, Scirpus maritimus,* and *Phragmites communis.* The more stable mud supported a vegetation of *Atriplex Babingtonii, Glyceria, Scirpus, Aster Tripolium,* and *Agrostis alba* var. *stolonifera,* whilst *Alopecurus geniculatus, Triticum repens, Apium graveolens* and *Elymus arenarius* were occasionally found. The shoreward margin of the mud flat was occupied entirely by *Phragmites communis.* The Ouse is tidal at Ousefleet, but the vegetation was not that of a typical salt marsh, but rather of a mud flat at the side of a fresh-water river.

Two other features of ecological interest were the dwarf plants of *Plantago major, Medicago lupulina, Convolvulus arvensis,* and many other species found in the sand pits at Pollington, and the establishment of seedling oak trees on the peat of Goole Moor. Adult fruiting oak trees being rare in the latter habitat.

Mr. W. H. Burrell has kindly examined some mosses and hepatics which were collected by various members, and he reports the following from the ' Rabbit Hills ' :

*Sphagnum cymbifolium.*
*Cephalozia bicuspidata.*
*Polytrichum juniperinum.*
*P. commune.*
*Dicranella heteromalla.*
*Campylopus pyriformis.*
*Dicranum scoparium.*
*Orthodontium gracile* var. *heterocarpum.*
*Wehera nutans.*
*Amblysteqium Juratzkanum.*
*Hypnum aduncum.*
*H. stramineum.*
*H. Schreberi.*

From Goole Moor :
*Campylopus pyriformis.*
*Orthodontium gracile* var. *heterocarpum.*
*Amblystegium serpens.*

The *Orthodontium* was frequent on living tree bases and on dead timber on the ' Rabbit Hills,' and it was difficult to find the usually common species, *Dicranella heteromalla*, in this locality. Again, on the peat on Goole Moor, the *Orthodontium* was abundant where *Dicranella cerviculata* was expected to occur.

**Fungi** (F. A. Mason) : There was a commendably strong representation of the Mycological Committee at this meeting with eleven members in attendance, and I have to thank Messrs. T. Petch and W. G. Bramley for reports since received. The best collecting ground proved to be the Rabbit Hills, at Rawcliffe, where most of the Agarics were found, and among them *Coprinus comatus* occurred in a well-marked ring about 3 yards in diameter. During the excursion to Goole Moor the nodules produced by **Frankiella Brunchorsti* (Möll.) Maire, on the roots of *Myrica Gale* were examined and found to be much more hairy in appearance than those seen at Foulsike last year, *The Naturalist*, 1933, p. 136. A few species only were collected at Ousefleet, where the wet condition of the herbage hampered work considerably ; the most interesting species seen there was the ergot of *Claviceps purpurea* (Fr.) Tul., on *Festuca arundinacea*. A few Uredines and other micro-fungi were collected along the Ouse embankment between Hook and Boothferry.

In the list given below the following annotations are used :

†=New to Yorkshire. *=New to V.C. 61. R.=Rawcliffe.
G.=Goole Moor. O.=Ousefleet. H.=Hook.

Phycomycetes.

*Peronospora effusa* Rabenh., on *Chenopodium Bonus-Henricus*, R.
*P. alta* Fuckel, on *Plantago major*, R.
*Plasmopara nivea* Schroet., on *Heracleum*, R.

Plectomycetes.

**Onygena corvina* A. & S., on feathers, G.
*Sphaerotheca pannosa* (Wallr.) Lév., on *Rosa*, R.
*Erysiphe cichoracearum* D.C., on *Heracleum*, R.

Discomycetes.

*Orbilia leucostigma* Fr., on chips, R.
*Helotium herbarum* (Pers.) Fr., on dead twigs, R.
*H. cyathoideum* (Bull.) Karst., on dead twigs, R.
**H. epiphyllum* (Pers.) Fr., on dead twigs, R.
*Hyaloscypha hyalina* (Pers.) Boud., on dead wood, R.
*Mollisia cinerea* (Batsch) Fr., on dead wood, R.
*Stegia Ilicis* Fr., on fallen holly leaves, R.
*Rhytisma acerinum* (Pers.) Fr., on sycamore leaves, R.

Pyrenomycetes.

†*Melanospora parasitica* Tul., on *Isaria farinosa*, R.
*Claviceps purpurea* (Fr.) Tul., on *Festuca arundinacea*, O.
**Euryachora betulina* Fr., on dead birch leaves, G.
*Phyllachora graminis* (Pers.) Fuckel, on grasses, G.
*Epichloë typhina* (Pers.) F., on *Holcus lanatus* G.
**Rhopographis Pteridis* (Low.), Wint., on bracken, G.
*Melanomma pulvis-pyrius* (Pers.) Fuckel, on dead wood, R.
*Leptosphaeria acuta* (Moug. & Nestl.) Ces. & de Not., on dead nettle stems, R.
**Hypoxylon coccineum* Bull., on birch, G.

BASIDIOMYCETES.

*Ustilago longissima* (Sow.) Tul., on *Glyceria fluitans*, O.
**Melampsoridium betulinum* (Pers.) Kleb., on *B. alba* seedlings, G.
*Coleosporium Tussilaginis* Tul., on coltsfoot.
*C. Sonchi*, Lév., on *Sonchus oleraceus*, H.
*Triphragmium Ulmariae* Wint., on meadowsweet, G.
*Phragmidium subcorticium* (Schrank) Wint., on *Rosa*, R., G.
*Uromyces Rumicis* (Schum.) Wint., on *R. acetosa*, H.
*U. Poae* Rabenh., *Uredo* and *teleuto* sporcs on *Poa trivialis*, H.
**U. Dactylidis* Otth., on *D. glomerata*, H.
*Puccinia Centaureae* D.C., on knapweed, G.
**P. Cnici-oleracei* Pers., on *Cirsium palustre*, G.
*P. obtegens* Tul., on *Cirsium arvense*, R., G.
**P. Leontodontis* Jacky, on dandelion, R.
**P. Taraxici* Plowr., on dandelion, G.
*P. variabilis* Grev., on dandelion, R., G.
**P. Sonchi* Rob., on *Sonchus oleraceus*, H.
*P. Menthae* Pers., on *Mentha arvensis*, G.
*P. pulverulenta* Grev., on willow herb, G.
*P. Polygoni-amphibii* Pers., on *P. amphibium*, G.

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*Phallus impudicus*, R. *Seleroderma aurantia*, R., G.
*Sphaerobolus stellatus*, O.

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*Amanita rubescens*, R., G.
*Amanitopsis fulva*, R., G.
*Tricholoma terreum*, R.
*Russula furcata*, R.
*R. ochroleuca*, R.
*R. fragilis* and var. *fallax*, R.
*Mycena lactea*, R.
*M. galericulata*, R.
*M. galericulata*, var. *calopus*, R.
**M. acicula*, R.
*M. hematopus*, R.
*M. sanguinolenta*, R.
*Marasmius dryophilus*, R.
*Androsaceus androsaceus*, R., O.
*A. epiphyllus*, R., O.
*Lactarius subdulcis*, R.
*L. turpis*, R., G.
*Omphalia umbellifera*, G.
*Clitocybe ericetorum*, G.
*Paxillus involutus*, R., G.
*P. lepista*, R.
*Tubaria furfuracea*, R., O.
**T. paludosa*, G.
**Astrosporina scabella*, R.
*Inocybe rimosa*, R.
*Galera tenera*, R., G.
*G. hypnorum*, R., G.
*Cortinarius* (*Dermo*) *cinnamomeus*, R.
*Psalliota campestris*, R.
**Stropharia coronilla*, O.
*Hypholoma fasciculare*, R.
*Psathyra sub-balteata*, R.
*Psathyrella disseminata*, R.
*Coprinus micaceus*, R.
*C. plicatilis*, R.
*C. niveus*, R.

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*Boletus subtomentosus*, R. *Fomes annosus*, R.
*Polyporus betulinus*, R. *F. nigricans*, R.

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*Stereum rugosum*, R. *Thelephora terrestris*, R.
*S. hirsutum*, R. *Peniophora velutina*, R.
*Calocera viscosa*, R.
*Exobasidium vaccinii*, G.

FUNGI IMPERFECTI.

**Phoma herbarum* West., on dead umbelliferous stems, R.
**Oidium alphitoides* Griff. and Maubl., on oak and sycamore, R., G.
*O. farinosum* Cooke, on hawthorn shoots, R.
**Penicillium expansum* Thom, on oak apple-gall.
†*Sporotrichum Isariae* Petch, R.
*Botrytes cinerea* Pers., on decaying leaves, R.
*Beauveria Bassiana* (Bals.) Vuill., on leaf hoppers, spider and ant, R.; on beetle, G.
*B. densa* (Link) Vuill., on beetles, R.

*Spicaria* (*Isaria*) *farinosa* (Holms.) Fr., on pupæ, ants, spider, aphis, R. ; on pupæ, G.
*Sepedonium chrysospermum* (Bull.) Fr., on *Paxillus involutus*, G.
**Gibellula aranearum* (Schw.) Syd., on spiders, R., G.
*Cladosporium herbarum* (Pers.) Link., on wheat, H.
*Polythrincium Trifolii* Kunze, on clover, H.

MYXOMYCETES.

*Fuligo septica* Gmelin, on vegetable debris, R., G.
**Stemonitis fusca* var. *confluens* Lister, on dead wood, R.

**Entomology** : The weather on Monday spoilt the opportunity of collecting from the Ouse shores, and we were denied the sight of the dragonfly, *Libellula depressa* L., which was reported in the circular as plentiful here on June 18th this year. Other dragonflies seen were *Agrion puella* L. and *Sympetrum striolatum* Charp. from the Rawcliffe area and *Sympetrum scoticum* Don. from Goole Moor.

**Lepidoptera** : Mr. ROSSE BUTTERFIELD reports that he saw a large skipper butterfly (*Silvanus*) on the edge of Goole Moor, and on the Ouse shore at Goole *Leucania pallens*. Other moths noted were *Charæas graminis*, *Triphæna ianthina*, *Cidaria testata*, *Acronycta rumicis*, and *Hadena dentina*.

**Diptera** : CHRIS. A. CHEETHAM states that one of the most interesting additions to the Yorkshire list is due to Mr. J. Wood, who persisted in collecting under the damp depressing weather conditions of Monday on the shore at Ousefleet. Here he found a gall maker, *Paroxyna* (*Tephritis*) *plantaginis* Hal. in fair numbers on the very large plants of the sea aster, plants which many of our botanists took for Michaelmas daisies as they were four to five feet in height. On Goole Moor the beautiful *Chrysops relicta* Mg. took part in the attack on the visitors with the cleg, *Hæmatopota pluvialis* L. and the mosquito *Ochlerotatus annulipes* Mg. The complete list of diptera is as follows :

*Ochlerotatus waterhousei* Theo.
*O. annulipes* Mg.
*Tipula cava* Riedel.
*Chloromyia formosa* Scop.
*Hæmatopota pluvialis* L.
*Chrysops relicta* Mg.
*Empis livida* L.
*Dolichopus vitripennis* Mg.
*Pipunculus pratorum* Fln.
*P. nigritulus* Ztt.
*Melanostoma scalare* F.
*Ischyrosyrphus glaucius* L.
*Catabomba pyrastri* L.
*Syrphus vitripennis* Mg.
*S. balteatus* Deg.
*S. auricollis* Mg.
*Volucella pellucens* L.
*Eristalis tenax* L.
*E. arbustorum* L.
*E. horticola* Deg.
*Syritta pipiens* L.
*Sicus ferrugineus* L.
*Micropalpus vulpinus* Fln.
*Oliveria lateralis* F.
*Graphomyia maculata* Scop.
*Anthomyia pluvialis* L.
*Cænosia octopunctata* Zett.
*Cnemopogon apicalis* Mg.
*Tetanocera elata* F.
*Ensina sonchi* L.
*Tephritis leontodontis* Deg.
*Paroxyna* (*Tephritis*) *plantaginis* Hal.
*Ochthiphila polystigma* Mg.

**Aculeates** : Mr. ROSSE BUTTERFIELD reports that Mr. J. Wood sent him a collection of these taken on Saturday, and also additons taken on Monday. He found the Goole moor area somewhat disappointing, being no longer virgin land owing to the deep trenches cut in the peat for drainage, also the lateness of the date may have had an effect on the insects, even then he expected to have seen more aculeates as conditions were not unfavourable. He gives the following list :

*Thyreopus cribrarius.*
*Clytochrysus chrysostomus.*
*Hoplocrabro quadrimaculatus.*
*Halictus atricornis.*
*H. morio.*
*H. freygessneri.*

*Pompilus plumbeus.*
*Trypoxylon clavicerum.*
*Mellinus arvensis.*
*Colletes picistigma*
*Epeolus productus.*
*Bombus agrorum.*
*B. hortorum.*
*B. latreillellus.*
*B. terrestris.*
*Psithyrus vestalis.*

**Conchology** : Mrs. E. M. Morehouse says : On Saturday more attention was given to the Rabbit Hills, Rawcliffe. No doubt many molluscs would have been seen under damper conditions, as it was a perfect summer day following the drought only three species were found :
*Euconulus fulvus* Müll.
*Hygromia hispida* Linné.
*Vitrina pellucida* Müll.

On August 5th Goole Moor was visited, and the following shells of molluscs were given to me :
*Planorbis corneus* Linné.
*P. umbilicatus* Müll.
*Bithynia tentaculata* Linné.
*Helix nemoralis* var. *libellula* s.v. *cuiviera* Moq. 00300.

Ousefleet was visited on August Bank Holiday. The side of the embankment and the reeds between that and the River Ouse *Helix nemoralis, Teba cantiana* and *Arianta arbustorum* were to be found abundantly. By far the most interesting feature was the numerous specimens of *Arion ater* var. *aterrima* Taylor. The type form *Arion ater* being entirely absent. The following list comprises those species observed :
*Arion ater* var. *aterrima* Taylor.
*A. ater* var. *brunnea* (Roebuck).
*Agriolimax agrestis* Linné.
*A. agrestis* var. *reticulata* Müll.
*A. agrestis* var. *pallida* Schrenk.
*Vitrea nitidula* Drap.
*V. cellaria* Müll.
*Helix nemoralis* var. *libellula* Resso. 00000.
*H. nemoralis* var. *quinquefasciata* Moq. 12345.
*H. nemoralis* var. *gronovia* Moq. (123)(45).
*H. nemoralis* var. *rubella* Perard 00000.
*H. nemoralis* var. *rubella* s.v. *quettardia* Moq. 00300.
*H. nemoralis* var. *rosea-quinquefasciata* 12345.
*H. nemoralis* var. *rosea* 02345.
*H. nemoralis* var. *rosea* (123)45.
*Arianta arbustorum* Linné.
*Theba cantiana* Montagu.

Nearly all the *A. arbustorum* around Ousefleet showed a distinct tendency towards being conoida.

**Vertebrate Zoology** : Mr. H. B. Booth writes : For a mixed, well-cultivated and wild country we found bird life rather sparsely distributed. In the woods the Jay was fairly numerous, and we also saw a pair of Magpies and a Sparrowhawk. Partridges were fairly common, and the Red-legged Partridge was reported.

On the river bank were Redshanks, Lapwings, a few Mallard, and various species of gulls. We were rather surprised to see eight Brent Geese so early, but the keeper of the sluice gates of the Adlingfleet drain, said it was just about the time for the advance guards to arrive. He also told us that various species of geese swarmed about his house in the winter.

The Viviparous Lizard was noticed on Goole Moor, and we were informed that formerly the Viper was very common there ; but it had been exterminated by the numerous peat workers.

# YORKSHIRE ENTOMOLOGISTS AT FOUNTAINS ABBEY.

W. D. HINCKS, M.P.S., F.R.E.S., M.S.B.E.

A few members of the Entomological and Plant Galls Sections of the Union attended a field meeting to the Skell Valley, near Fountains Abbey, on June 23rd.

The material collected was almost all taken on the banks of the River Skell between the Abbey and Skell Spa, and is thus derived from precisely the same ground as that covered by the Union on August Bank Holiday Monday, 1933. The list given below is therefore supplementary to, and should be read in conjunction with, the report of the Union meeting referred to (*Naturalist*, 1933, pp. 235-237) and the additional notes printed in a later number (*Naturalist*, 1934, p. 10). All the specimens recorded below were taken by Messrs. Hincks and Dibb, with the exception of most of the *Hemiptera*, which are reported on by the late Mr. M. L. Thompson.

EPHEMEROPTERA :

*Ephemera danica* Müll. ! !
*Ecdyonurus venosus* (F.)
*Heptagenia sulphurea* (Müll.)
*Rhithrogena semicolorata* (Curt.) !
*Bætis tenax* Eat.
*Bætis binoculatus* (L.)
*Centroptilum luteolum* (Müll.)
*Cloeon dipterum* (L.)
*Ephemerella notata* Eat.
*Cænis horaria* (L.)

NEUROPTERA :

*Sialis lutaria* L.
*Chrysopa flava* Scop.
,, *alba* L.
*Nothochrysa capitata* (F.)
*Panorpa germanica* L.

ODONATA :

A single *Aschna* (*cyanea* or *juncea*) was seen and Mr. Thompson took a teneral ♂ *Enallagma cyathigerum* (Charp.)

PSOCOPTERA and PLECOPTERA were plentiful, but none of the species taken were additions to Mr. Brown's list (*Naturalist*, 1933, pp. 235-237), except the common *Chloroperla grammatica* (Poda).

HEMIPTERA :

The late Mr. M. L. Thompson sent the following list—

*Calocoris ochromelas* Gmel.
,, *sexguttatus* F.
,, *alpestris* Mey.
*Macrolophus nubilus* L.
*Cyllocoris histrionicus* L.
,, *flavonotatus* Boh.
*Harpocera thoracica* Fall.
*Phylus melanocephalus* L.
*Psallus variabilis* Fall.
,, *varians* H.S.
,, *roseus* F.
*Thamnotettix subfusculus* Fall.
*Eupteryx urticæ* F.
*Aphalara nebulosa* Ztt.

To these I add :

*Pentatoma rufipes* L.
*Miris holsatus* F.
*Lygus pratensis* L.
,, *pastinacæ* Fall.
*Liocoris tripustulatus* F.
*Cixius nervosus* L.
*Psylla alni* L.

COLEOPTERA :

*Leistus rufescens* F.
*Agabus guttatus* Pk.
*Tachinus subterraneus* L.
*Stenus picipes* S.
,, *similis* Hb.
*Lesteva longelytrata* Gz.
*Anthobium minutum* F.
*Dolopius marginatus* L.
*Corymbites incanus* Gy.
*Denticollis linearis* L.
*Helodes minuta* L.
*Cyphon padi* L.
*Cantharis fusca* L.
*Malthinus frontalis* Mm.
*Malthodes marginatus* Lt.
,, *mysticus* Kw.
,, *dispar* Gm.
,, *fuscus* Ol.
,, *minimus* L.
,, *pumilus* Brb.
*Dryophilus pusillus* Gy.
*Grammoptera ruficornis* F.
*Leiopus nebulosus* L.
*Chrysomela polita* L.
*Phædon tumidulus* Gm.
*Longitarsus suturellus* Df.
,, *melanocephalus* Dg.
**Phyllotreta tetrastigma* Cm.
*Crepidodera transversa* Mm.
*Chætocnema concinna* Mm.
*Anaspis humeralis* F.
,, *maculata* Fc.
*Apion pubescens* K.
*Otiorrhynchus singularis* L.
*Strophosomus melanogrammus* Fo.
*Phyllobius argentatus* L.
,, *pomonæ* Ol.
*Sitona lineatus* L.
*Cionus alauda* Hb.
,, *pulchellus* Hb.
*Magdalis armigera* Gf.

HYMENOPTERA (*Tenthredinoidea*) :

*Tenthredella atra* L.
,, *moniliata* Kl.
,, *livida* L. !
,, *colon* Kl.
,, *mesomela* L. !
*Allantus arcuatus* Forst.
*Tenthredopsis nassata* L.
*Rhogogaster viridis* L.
*Pachyprotasis rapæ* L.
*Athalia lineolata* Lep.
*Stromboceros delicatulus* Fall.
*Emphytus carpini* Htg.
†*Arge* (*Hylotoma*) *ciliaris* L.
†*Hartigia linearis* Sch.
*Cephus pallipes* Kl.

DIPTERA :

*Procladius choreus* Mg.
*Microtendipes pedellus* De G.
*Macrocera lutea* Mg.
*Rhymosia domestica* Mg.
*Mycomyia cinerascens* Ztt.
*Liriope lacustris* Mg.
*Chrysophilus auratus* F. !
*Sargus iridatus* Scop.
*Beris chalybeata* Forst.
*Rhamphomyia nigripes* F.
*Trichopeza longicornis* Mg.
*Dolichopus claviger* Stan.
,, *brevipennis* Mg. !
,, *ungulatus* L. !
,, *pennatus* Mg.
,, *popularis* W.
,, *plumipes* Scop.
,, *simplex* Mg.
,, *festivus* Hal.
*Gymnopternus aerosus* Fln.
,, *cupreus* Fln. ! !
*Xiphandrium appendiculatum* Zh.
,, *monotrichum* Lw.
*Argyra argyria* Mg.
,, *argentina* Mg.
*Chilosia albitarsis* Mg.
*Platychirus peltatus* Mg.
*Pyrophæna granditarsa* Forst.
*Syrphus* (*Lucozona*) *lucorum* L.
*Syritta pipiens* L.
*Zelima Sylvarum* L.
*Volucella pellucens* L.
,, *bombylans* L.
*Loxocera sylvatica* Mg.
*Tetanocera punctulata* Scop.
*Peplomyza litura* Mg.
*Urophora solstitialis* L.

Since the above was written Mr. Cheetham has kindly confirmed my determination of a ♀ *Anepsiomyia flaviventris* which is an addition to the county list. He has also determined a ♀ *Empis Pennipis*, L.

* Hitherto recorded from Studley in 1905 by Mr. Thompson.
† These appear to be new county records.

# THE FUNGUS FORAY AT INGLETON.

F. A. MASON AND JOHN GRAINGER.

The Meeting of the Mycological Committee of the Yorkshire Naturalists' Union was held at Ingleton from Saturday, September 15th, to Thursday, September 20th, 1934. A good attendance of members, particularly at the week-end, enabled much work to be accomplished. Conditions during the week-end were at first somewhat dry, but a thunderstorm which interrupted the Annual Meeting improved the later collections.

Mr. T. Petch, B.A., B.Sc., Chairman of the Committee, presided at the Annual Meeting, which was held at the Ingleborough Hotel on Saturday, September 15th, at 8 p.m. The Chairman spoke about 'Mycology at the Tropics,' and showed that European species did not usually occur in the Tropical Zone, as exemplified by Ceylon. Much useful information about the seasonal distribution of fungi and the occurrence of special types, was imparted. Horse-hair Blights, Thread Blights, Black Rusts, Leaf Fungi, and several interesting types of Gasteromycetes were dealt with by the lecturer. A study of the fungi of the nests of Termites originally aroused Mr. Petch's interest in entomogenous fungi. Much interesting discussion followed the lecture.

Miss D. Hilary, B.Sc., was unanimously elected Chairman for the coming year, but otherwise the Officers and Members of the Committee were re-elected as before, with the exception of Mr. Snelgrove, whose memory was honoured in silence.

The advisability of closer contact with the general public of the place of meeting was considered, and the Hon. Secretary of the Committee was empowered to invite local schoolmasters and selected children to view the collections of fungi. The policy of giving public lectures is to be continued and amplified.

An extensive series of photographs of fungi taken by Mr. F. A. Mason was on view throughout the meeting, and was much appreciated by all present.

On Sunday evening, September 16th, Mr. T. Petch gave a very helpful lecture on 'Claviceps.' Mr. Petch is making a special study of the Hypocreaceae, a section of the Pyrenomycetes, and outlined some of the problems he had encountered when investigating the Genus *Claviceps* (Ergot-producing fungi). General features of the life history of *C. purpurea*, which forms ergots on Rye and many other grasses, were given. Five English species of *Claviceps* have been described, and their relations were discussed at length. It is hoped that the full text of the lecture will be published in the *The Naturalist*.

The first three days of the Foray were devoted to the examination of the Ingleton Glens, including both the East and the West sides of Beezley Glen, and Thornton Glen as far as Pecca Falls. The vegetation is of the Oakwood-Ash and Oakwood-Holly types, and the greater proportion of the species of fungi seen during the other excursions occurred in these woods. In the following list, 'I.' indicates gatherings made at Ingleton and in the two Glens.

On Tuesday the scrub-woods at Oxenber were visited from Wharfe, near Austwick. Here members had an opportunity of seeing *Gymnosporangium clavariaeforme* in its teleutospore stage on Juniper, and the aecidial condition on Hawthorn. A sloping field formed the rather unusual habitat of considerable number of lepidopterous larvæ parasitised by *Cordyceps militaris*, and the species of Hygrophorus and of Clavaria were seen most abundantly on this excursion. The species listed on Oxenber and in Wharfe Woods are annotated by 'W.'

The final excursion on Wednesday to the Clapham Hall Woods by Keasden Beck was curtailed through heavy rain, but a few interesting additions to the list were made as indicated by 'K.'

On all the excursions Mr. Chris. A. Cheetham acted as guide, and his intimate knowledge of the district, both geographically and botanically, was an advantage the Mycological Committee has rarely had at its command.

Mr. Petch worked out the entomogenous fungi, Pyrenomycetes and Myxomycetes, and we are indebted to Messrs. W. G. Bramley and G. W. H. Johnson for assistance in compiling the following list.

*=New to Mid-West Div. (V.C. 64). †=New to Yorkshire.

HYMENOMYCETES.

*Amanitopsis vaginata*, I., K., W.,
*A. fulva*, K., W.
*A. strangulata*, I.
*Amanita mappa*, I.
*A. phalloides*, I.
*A. verna*, I.
*A. muscaria*, W.
*A. spissa*, I.
*A. rubescens*, I., K., W.
*Lepiota cristata*, I., W.
*L. carcharias*, W.
*Armillaria mellea*, common.
*A. ramentacea*, W.
*Tricholoma flavobrunneum*, I., W.
**T. saponaceum* var. *squamosum*, I.
*T. rutilans*, I., W.
*Russula lepida*, I., W.
*R. furcata*, I.
*R. foetans*, I., W.
*R. ochroleuca*, I., W., K.
var. *granulosa*, W.
*R. fellea*, I., W.
*R. subfoetans*, I.
*R. rubra*, I., W.
*R. fragilis*, I., W., K.,
var. *fallax*, I.
*R. emetica*, I., W.
*R. chloroides*, I.
*R. nigricans*, I., W., K.
*R. adusta*, I., W.
*R. virescens*, I., W.
*R. cyanoxantha*, common.
*Mycena lactea*, W.
*M. rugosa*, I., K.
*M. galericulata*, I., W., K.
*M. polygramma*, I., W.
*M. alkalina*, I., W.
*M. tenella*, I., W.
*M. acicula*, W.
*M. hæmatopus*, I., W.
*M. sanguinolenta*, I., W.
*M. galopus*, I., W., K.
*M. epipterigea*, W.
*M. tenerrima*, W.
*Collybia radicata*, I., W.
*C. platyphylla*, I., K.
*C. butyracea*, I., W., K.
*C. maculata*, common.
*Marasmius peronatus*, I., W., K.
*M. hariolorum*, I.
*M. dryophilus*, I., W.
*M. ramealis*, W.
*Androsaceus rotula*, I., W.
**A. graminum*, W.
*Lactarius torminosus*, I., W.
*L. turpis*, I., W., K.
**L. pubescens*, I.
*L. blennius*, W.
*L. pyrogalus*, I., W., K.
*L. piperatus*, W., I.
*L. vellereus*, *I.*, *W.*
*L. quietus*, I., W.
*L. aurantiacus*, W.
*L. rufus*, I., W., K.
*L. subdulcis*, I., W.
*Hygrophorus eburneus*, W.
*H. pratensis*, W.
*H. virgineus*, I., W.
*H. niveus*, I., W.
*H. Clarkii*, W.
**H. vitellinus*, W.
*H. ceraceus*, W.
*H. coccineus*, I., W.
*H. miniatus*, W.
*H. puniceus*, I., W.
*H. calyptræformis*, I., W.
*H. psittacinus*, I., W., K.
*H. chlorophanus*, I., W.
*Clitocybe aurantiaca*, I.
*C. pithyophila* W.
*C. dealbata*, I.
*C. infundibuliformis*, I., W., K.
*C. geotropa*, I.
*Laccaria laccata*, common.
var. *amethystina*, W., K., I.
*L. tortilis*, K.
*Omphalia pyxidata*, W.
*O. umbellifera*, K.
*O. fibula*, W.
*Pleurotus applicatus*, I.
*Pluteus cervinus*, I., W.
*P. nanus*, W.
**Entoloma Bloxamii*, I.
*E. jubatum*, W.
*E. niderosum*, W., I.
*Leptonia euchroa*, K.

*Leptonia lampropus*, W.
*Pholiota mutabilis*, W., K.
*Bolbitius titubans*, W.
*Inocybe rimosa*, I., K.
*I. geophylla*, I.
var. *lilicina*, I.
*I. fastigiata*, I.
*Astrosporina asterospora*, I.
*Galera tenera*, I., W.
*G. hypnorum*, common.
*Flammula sapinea*, K.
*F. alnicola*, W.
*Cortinarius* (*Myx.*) *elatior*, I., W., K.
**C.* (*Ino*) *violaceus*, K.
*C.* (*Ino*) *pholideus*, W.
*C.* (*Dermo.*) *caninus*, W.
*C.* (*Dermo.*) *cinnamomeus*, W.
*C.* (*Hydro*) *bicolor*, W.
*Crepidotus mollis*, I.
*Psalliota campestris*, W.
*Stropharia aeruginosa*, I., W.
*S. albocyanea*, I.
*S. stercoraria*, W., K.
*S. semiglobata*, common.
*Anellaria separata*, I.
*Hypholoma sublateritium*, I., W.
*H. fasciculare*, common.
*H. velutinum*, W.
*Panaeolus papilionaceus*, I., W., K.
*P. subbalteatus*, W.
*Psathyrella gracilis*, W.
*P. disseminata*, W.
*Psathyra conopilea*, K.
*P. spadiceo-grisea*, W.
*Psilocybe semilanceata*, common.
*P. spadicea*, K.
*Coprinus atramentarius*, W.
*C. squamosus*, common.
*C. cinereous*, I., K.
*C. niveus*, W.
*C. plicatilis*, common.
*Tylopilus felleus*, I.
*Boletus elegans*, I., W., K.
*B. badius*, I., W., K.
*B. chrysenteron*, I., W., K.
*B. subtomentosus*, I., W., K.
*B. edulis*, I.
*B. rubiginosa*, I.
*B. variaecolor*, I.
*B. luridus*, I.
*B. scaber*, I., W., K.
*Polyporus perennis*, I.
*P. squamosus*, I., W.
*P. velutinus*, I., W.
*P. lacteus*, I., K.
*P. caesius*, I.
*Fomes annosus*, I., K.
*F. connatus*, I.
*Poria sanguinolenta*, K.
*Polystictus versicolor*, common.
*Irpex obliquus*, common.
*Phlebia merismoides*, W.
*Coniophora puteana*, W.
*Hydnum repandum*, K.
**H. repandum* var. *rufescens*, I.
**Odontia aurea*
*Stereum rugosum*, I., W.
*S. hirsutum*, I., W., K.
*S. purpureum*, W.
*Hymenochaete rubiginosa*, I.
*H. corrugata*, I.
*Clavaria cinerea*, I., K.
*C. corniculata*, W.
*C. aurea*, I.
*C. inaequalis*, W.
**C. persimilis*, W.
*C. vermicularis*, W.
*C. fumosa*, W.
*Tremella mesenterica*, W.
*Dacryomyces deliquescens*, I., W., K.
*Calocera viscosa*, I., K.
*C. cornea*, K.

## Gasteromycetes.

*Phallus impudicus*, I., W.
*Lycoperdon perlatum*, I., W., K.
*L. pyriforme*, I., W., K.
*Bovista nigrescens*, W.
*Scleroderma aurantium*, I., W., K.
*S. verrucosum*, I.

## Uredinales.

*Puccinia obtegens* Tul., on *C. arvense*, I., W.
*P. Centaureæ* Dc., on *C. nigra*, I., W.
*P. Menthæ* Pers., on *Mentha* sp., I.
*P. Poarum* Niels. on *T. farfara* and *Poa* sp., I., W.
*P. holcina* Eriks., on *Holcus mollis*, I.
*Puccinia Lolii* Niels., on *L. perenne*, I.
*P. variabilis* Grev. on *T. officinale*, I., W.
*P. Leontodontis* Jacky on *L. autumnalis*, I., K.
*P. major* Diet. on *C. paludosa*, I.
*P. Hieracii* Mart. on *Hieracium* sp., I., W.

*Puccinia Celakovskyana* Bub., on *Galium cruciatum*, I.
*P. obscura* Schroet., on *Luzula campestris* and *L. sylvaticum*, I.
*P. Baryi* Wint. on *Brachypodium sylvaticum*, I.
*Uromyces Dactylidis* Otth. on *D. glomerata*, I.
*U. Trifolii* Lev. on *T. repens*, I., W.
*Triphragmium Ulmariæ* Wint. on *S. Ulmaria*, I., W.
*Phragmidium Rubi* Wint. on *Rubus* St., I., K.
*Coleosporium Senecionis* Fr., I.
*C. Tussilaginis* Tul., I., K.
*C. Petasitis* Lev., I., K.
*Melampsora Larici-Caprearum* Kleb. on *S. Caprea*, I.
*M. Tremulæ* Tul., on *P. tremula*, I.
*Melampsoridium betulinum* Kleb., on *B. alba*, I.
*Pucciniastrum Circæae* Speg., on *C. Lutetiana*, I., K.

### Phycomycetes.

*Peronospora effusa* Grev. on *C. bonus-Henricus*.
*Syzygites megalocarpus* Ehrenb. on dead agarics, W.
*Pilobolus crystallinus* Tode, on horse dung, W.
*Empusa Muscæ* Cohn., resting spores, I., K.
*Entomophthora sphærosperma* Fres., on flies, I ; on *aphis*, I.
**E. echinospora* Thaxter, on flies, I.
*E. dipterigena* Thaxter, on flies, I., K.
**E. variabilis* Thaxter, on flies, I., W.
**E. Richteri* (Bres. and Star.) Bubak, on flies, I., W.

### Pyrenomycetes.

*Nectria sanguinea* (Bolt) Fr., on immature pyrenomycete, I.
*N. coccinia* (Pers.) Fr., on elm, W.
†*N. sinopica* Fr., on Ivy, W.
*Cordyceps militaris* (Linn.) Link, I., W.
*Claviceps purpurea* Tul. (ergot) on *Brachypodium silvaticum*, and *Bromus gigantus*, I.
*Zignoëlla pulviscula* (Curr) Sacc., I.
*Melanomma Pulvis-pyrius* (Pers.) Fckl., I.
*Diatrype stigma* (Hoffm.) Fr., I.
*Hypoxylon cohærens* (Pers.) Fr., on Hazel, I.
*H. fuscum* (Pers.) Fr., I.
*H. multiforme*, Fr., I.
*Xylaria Hypoxylon* (Linn.) Grev., I.

### Discomycetes.

*Helvella crispa* Fr., I.
*H. lacunosa* Afz., I.
*Leptopodia elastica* (Bull.) Boud., W.
*Ciliaria scutellata* (Linn.) Quél., I., W.
*Cheilymenia coprinaria* (Cke.) Bond., W.
*Humaria granulata* Bull., W.
*Ascophanus carneus* (Pers.) Boud., I., W.
*Calycella citrina* (Hedw.) Quél., W.
*Coryne sarcoides* (Jacq.) Tul., I., W.
*Bulgaria inquinans* (Pers.) Fr., I.
*Orbilia lencostigma* Fr., W., K.
*O. xanthostigma* Fr., I., W.
*Helotium herbarum* (Pers.) Fr., W., K.
*H. aureum* Pers., I., W.
*Dasyscypha virginea* (Batsch) Fckl., W.
*Tricoscypha calycina* (Schum.) Boud., I., W.
*Hyaloscypha hyalina* (Pers.) Boud., W., K.,
*Mollisia cinerea* (Batsch) Fr., I., W., K.
*Pseudopeziza Trifolii* (Biv.-Bern.) Fckl. (conidial stage *Polythrincium*), I.
*Stegia Ilicis* Fr., common.
*Rhytisma acerinum* (Pers.) Fr., common.

FUNGI IMPERFECTI.

*Oidium alphitoides* Griff. and Maubl., on Oak, I., K.
*Sepedonium chrysospermum* (Bull.) Fr., on *agarics* and *boleti*, I., W., K.
*Botrytis cinerea* Pers. on dead leaves, W.
*Beauveria Bassiana* (Bals.) Vuill., on beetle, W.
*Cladosporium herbaram* (Pers.) Link., on damp paper, W.,
*Isaria farinosa* (Holms.) Fr., I., W., K.
*I. brachiata* (Batsch) Schum., I.
*Hymenostilbe arachnophila* (Ditm.) Petch, I.
*Helicosporium Mülleri* (Corda) Sacc., I.

MYXOMYCETES.

*Physarum nutans* Pers., I., W., K.
*P. viride* Pers., W.
*Fuligo septica* Gmel., I., W.
*Leocarpus fragilis* Rost., W.
*Didymium squamulosum* Fr., I.
*Stemonitis fusca* Roth., I.
*S. flavogenita* Jahn., I.
*Comatricha nigra* Schroet., I., W.
*C. laxa* Rost., I.
*Lycogala epidendrum* Fr., I.
*Trichia affinis* de Bary, I.
*T. decipiens* Macbr., I.
*T. botrytis* Pers., I., W.
*Hemitrichia clavata* Rost., I.
*Arcyria cinerea* Pers., I., W., K.
*A. pomiformis* Rost., W.
*A. denudata* Wettst., W.
*A. nutans* Grev., I., K.
*Perichæna corticalis* Rost., I.

## REVIEWS AND BOOK NOTICES.

**Our Garden Birds,** by **H. Mortimer Batten,** pp. 192, 39 coloured plates, 5s. net. (Nelson & Sons: T. C. & E. C. Jack). This handy book gives a clear account of the habits and appearance of forty common English birds, including all those which may normally be induced to visit gardens. A key is given to the few descriptive terms employed and also a summary of the foods of different types of birds. The written descriptions of the birds are quite adequate, the notes on their habits are good, and the coloured illustrations reach a high standard. It may be said that the book is written not for ornithologists, but for those who are interested enough to provide feeding places and nesting places in their gardens. Hence, Mr. Batten includes at the end a list of feeding places and nesting boxes suitable for different types of birds. This is both an interesting and a useful little book.

**Sea Terns or Sea Swallows,** by **George Marples and Anne Marples,** pp. xii+227 with 117 plates and 21 drawings and diagrams. (Country Life, Ltd. Price 15/-). This is a very fine piece of work carried out by two competent and painstaking observers. Mr. and Mrs. Marples have investigated Terns on scientific lines for many years and this book gives an exhaustive but eminently readable account of their labours. There are chapters on identification, distribution, migration, mating, nesting, food and habits, and, very important, a really good essay on 'Tern language.' The many illustrations are excellent both in quality and appropriateness. It is to be hoped that the authors will give us similar books on other groups of birds. The binding and printing are well up to the publishers' usual high standard.

**"Quest for Birds,"** by **W. K. Richmond,** pp. 196 with frontispiece and text figures. (Witherby. Price 7/6). The author of this thought-provoking book reminds us that most bird-books are *either* informative

*or* entertaining. His claim that ' Quest for Birds ' is both of these is fully justified. Up to quite recently it was almost impossible to find a scientific treatise on an ornithological subject which could be read with both interest and pleasure. For some reason they were usually incredibly dull, although we must except Mr. E. M. Nicholson's excellent volumes, which are both readable and erudite. Mr. Richmond throws down challenge after challenge all of which must be taken seriously. A chapter on ' The English Tradition in Ornithology ' is followed by thirteen others among which are those on ' Seeing New Birds,' ' The Balance of Birds,' ' Spring Song,' ' The Territory Theory and its Fallacies,' ' Nesting Birds,' ' Instinct, Intelligence, and Character among Birds,' ' Past and Present,' and problems of the species. His critical attitude towards modern views is best exemplified in the chapters on ' Spring Song ' and ' The Territory Theory.' It is a little difficult to understand why he so readily regards bird song as ' a sort of soul delirium ' It may be so, but there is no scientific evidence for the statement, and it is not all birds which sing and then it is only the male birds which perform and they generally confine their vocal activities to a rather significant part of the year. The facts surely fit in quite as well with the territorial theory of Howard and others. We want to believe with Mr. Richamond that birds derive much pleasure and satisfaction from singing, but we would like more proof that it is so than the author's mere statement that ' it is certain.' That Mr. Richmond is not much enamoured of the territory theory may be gathered from the following. He says ' To-day when the (Territory) theory is gravely accepted among nearly all ornithologists, it may seem mere heresy to say that one does not believe one word of it, and that even if it were true it explains nothing at all, for this in fact, is what my present chapter amounts to.' Perhaps this will be regarded as rather sweeping, but nevertheless *Quest for Birds* can be thoroughly recommended.

**England out of Doors,** an anthology selected by **W. Parker, M.C.,** edited by **A. R. Moon, M.A.,** pp. 8+166. (Longmans. Price 3/6). This small volume contains a very comprehensive selection of some of the best English writings on outdoor life. The contents are grouped under the headings : ' The Face of England,' ' English Wild Life,' and ' Outdoor Sports and Pastimes.' All the essays, etc., are complete in themselves and among the authors are to be found Hilaire Belloc, John Galsworthy, Percy Luffock, Viscount Grey, and G. M. Trevelyan. It is a book to put in the rucksac or the week-end bag.

**Creatures of the Wilds.** A book of animal adventure selected by **E. W. Parker, M.C.** Edited by **R. W. Jepson, M.A.,** pp. 176 with a coloured frontispiece and 14 drawings. (Longmans. 2/6). Here are eleven complete stories of wild life by such writers as Axel Munthe, J. G. Millais, Cherry Kearton, and Frank T. Ballen. They are all good and the book is wonderful value for the money.

**Real Adventure,** selected by **E. W. Parker, M.C.** Edited by **W. T. Hutchins, M.A.,** with a coloured frontispiece and 12 drawings, pp. 176. (Longmans. 2/6). This volume is uniform with the above in the same series and is every bit as good in its way. The compiler has selected ' accounts which will be recognised as the " real thing " by anyone who has encountered similar perils . . . . . such exploits are in themselves an incentive for the men of to-day and to-morrow.' The authors from whose works the extracts are taken include A. J. Evans, Captain Scott, Hilaire Belloc, Sir Francis Younghusband, Sir Ernest Shackleton, and F. S. Smythe.

**Hooton Pagnell—The Agricultural Evolution of a Yorkshire Village,** by **A. G. Ruston and Denis Witney,** pp. 459, 12 plates and 58 figures, 25s. net. (Edw. Arnold). Dr. Ruston and Mr. Witney may be congratulated on the production of this book. In the course of their work on agricultural economics, they have had occasion to study the past records of various farms and estates, among which were the full records of the manor of Hooton Pagnell, familiar to many of our readers as the property of the late Mrs. Warde-Aldam. The result of their work has been the production of this book, which is a complete study of the agricultural organisation and development of this Yorkshire manor. In doing this, the authors contrast the village of to-day with that of the time of the Doomsday Book. They show how it has been affected by the enclosure of the commons and the development of methods of farming. They indicate the way in which the resultant changes have affected ownership, land tenure, tenants' rights, and tithes. More important, they have been very successful in showing how agricultural problems of to-day are, in large part, the result of agricultural history. While this list of the contents may sound rather technical, the book itself is far from being so. The style is clear and the matter always of general interest. The authors have further succeeded in conveying a fascinating picture of early English village organisation. At least one reader, on closing the book, realised for the first time how much of the arrangement and organisation of our English countryside depends on that of mediæval times. Hence, while this is primarily, in its facts and citations, a book for the archæologist, agriculturist, or historian, it is also an impressive study of the influence of the past upon the present, and it is undoubtedly a book which no one who is interested in country life should fail to read.

**The Lion's Roar,** by **Cherry Kearton,** pp. 188, 38 photographs (Longman's Green and Co). This is a story of native life in Central Africa, in which the adventures of a small native family are followed. They quarrel with the tribal witch doctor and are evicted from their village. Their fortunes make a pleasant and readable story, with a background of lions and other wild animals. The author can congratulate himself on having transmitted the atmosphere of the country and the outlook of an alien race. In part this is no doubt due to the photographs. As might be expected from Mr. Kearton's camera, these are excellent and immediately enlist our sympathies with the aristocratic-looking Inguti and Umbeti. Wild animals are equally well portrayed. Mr. Kearton can also, however, tell his story simply and well.

**Laikan,** by **Joseph Wenter,** translated by **Chas. Ashleigh,** pp. 241, 1 plate, price 6/- net (Rich and Cowan). Laikan is the name given to a salmon born in the Rhine. This book tells of his adventures. It is quite good reading and gives a popular and colourful account of life in many waters. The story of the young salmon's experiences in descending the Rhine is extremely interesting and bears the hall mark of personal observation. One may confess that when Laikan reaches the sea, one has an impression that the author has read up his subject and is serving up a series of ' high spots.' Moreover, certain matters of fact are open to question. For example, do Atlantic salmon usually visit a whole series of rivers before returning to the one in which they were born? While these features may not detract from the merits of the book as a work of fiction, they tend to introduce a sense of unreality which might have been avoided, and which is regrettable in view of the general excellence of the matter. The book is, however, well worth reading, and a special word of praise is due to the translator.

## NEWS FROM THE MAGAZINES.

*The Proceedings of the Linnean Society* of London, Part III, includes a particularly interesting discussion on scientific nomenclature, and Professor F. E. Weiss' Presidential Address on ' The Northward Extension of the Mediterranean Flora ' contains much of interest to northern naturalists.

A well-illustrated description of ' Features of Construction of the Ryburn Dam,' by J. Noel Wood, appears in the *Transactions of the Institution of Water Engineers*, Vol. XXXVIII, just issued. Another paper in this volume likely to interest our readers is ' Algal Growths and Water Supply,' by J. W. Husband.

The *Journal of the Ministry of Agriculture* for August, 1934, contains an article by Dr. A. G. Rushton of Leeds University on ' Land Improvement by Warping,' with particular reference to the area near the Humber ; L. G. G. Warne on the botanical effects of intensive treatment of a Wiltshire down pasture. There is also an article by J. Turnbull on an improved type of spray for fruit trees.

*The Entomologist's Record* for September contains " Dutch forms of Lepidoptera described in Holland,' by B. J. Lempke ; ' Landscape Memories,' by G. T. Bethune-Baker (Switzerland and the Pyrenees) ; ' Nomenclature—The List,' by H. J. Turner ; several notes on collecting ; and supplements, ' British Noctuæ,' by H. J. Turner, and ' Butterflies of the Upper Rhone Valley,' by R. Verity.

The *Essex Naturalist* for April-September, 1934, contains Mr. William E. Clegg's Presidential Address on ' The Birds of the Lea Valley Reservoirs ' which is a valuable contribution to the literature on bird ecology, ' Some Essex Spiders,' by J. E. Hull. ' Observations on the Pupation of *Dytiscus Marginalis* L. and *Hydrous* (*Hydrophilus*) *Piceus* L.,' by Hugh Main, and ' The History of Mycology in Essex,' by J. Ramsbottom.

The *Scottish Naturalist* for September-October, 1934, contains the first part of a joint article on The Natural History of South Rona in which are given the results of a Biological Expedition from the University of St. Andrews in July, 1933. The number also contains notes on ' The Breeding Birds of the island of Hoy, Orkney ' ; ' Buturlin's Goose ' (*Anser carneirostris*) ; its Possible Occurrence in Scotland,' and notes on ' Parasites of *Abraxas grossulariata* in Fife.'

*The Entomologist* for September contains ' A catalogue of the Noctuæ of Ireland,' by Lt.-Col. C. Donovan ; ' Notes on two collections of Butterflies made in Palestine, with a note on the occurrence in Transjordan of an unrecorded species,' by F. Hemming ; ' Changes in the generic names of the Odonata,' by J. Cowley ; ' Indo-Australian Hesperiidæ ; descriptions of new genera, species and subspecies,' by Brig. W. H. Evans, and numerous notes and observations including migration records.

*The Entomologist* for August contains ' *Catoptria rubescana* (Constant), a distinct species (*Lep. Tortricidæ*),' by H. C. Huggins (with plate of *rubescana* and *aspidiscana*) ; ' A catalogue of the *Noctuæ* of Ireland,' by Lt.-Col. C. Donovan ; ' August Butterflies,' by R. James ; ' A new Australian Caddisfly (*Trichoptera*),' by M. E. Mosely ; ' Indo-Australian *Hesperiidæ* ; descriptions of new genera, species and sub-species,' by Brigadier W. H. Evans ; ' A new South American Hesperid,' by N. D. Riley, and numerous short notes and observations.

*The Journal of the Ministry of Agriculture*, Vol. XLI, July, 1934. This number contains an interesting article by Professor R. G. Stapledon

on the palatibility and management of the poorer grasslands, which gives interesting results obtained by manurial treatment and improvement of hill pastures. Of mycological interest are the ' Control of Club Root in Cauliflowers,' by N. C. Preston, and ' Snapdragon Rust,' by G. H. Pethybridge. G. E. Fussell contributes an account of the first English book on Clover, published in 1663, and its author, Andrew Yarranton, who seems to have been a man of many parts.

*The Entomologist's Monthly Magazine* for July contains ' A New British *Forcipomyia* (Diptera, Ceratopogonidæ),' by J. W. S. Macfie, and ' Note on the Capture of *Forcipomyia glauca* Macfie,' by F. W. Edwards (Hickling Broad, August, 1932, males hovering in a swarm) ; ' Systematic Notes upon British Aquatic Coleoptera,' by F. Balfour-Browne (*Hygrotus* and *Coelambus*) ; ' Notes on the Passalidæ,' by W. D. Hincks ; ' A Note on the British Species of *Ectobius* Steph.,' by K. G. Blair (*lapponicus*, *lividus* and *panzeri*) ; ' Recent Changes in the New Zealand Butterfly Fauna,' by G. V. Hudson ; ' Obituary, Rev. Wm. Frederick Johnson,' by J. J. Walker ; ' The Times of Emergence and Forms of *Pieris rapae* at Philadelphia, U.S.A.,' by Orazio Querci, and several short notes.

*The Entomologists' Monthly Magazine* for August contains ' The Times and Emergence and Forms of *Pieris rapæ* at Philadelphia, U.S.A.,' by Orazio Querci ; ' Systematic Notes upon British Aquatic Coleoptera,' by F. Balfour-Browne (*Deronectes* with figures) ; ' The Milkweed Butterfly, *Danaus plexippus* L. in the British Isles in 1933,' by Capt. T. Dannreuther ; ' On the Synonymy of *Elasmosoma berolinensis* Ruthe, as known in England,' by G. E. J. Nixon (new name *Neonurus bistigmaticus* Morley, a braconid parasite of the wood ant *Formica rufa*) ; ' The Asparagus Miner, *Melanagromyza simplex* Lolw. (Diptera, *Agromyzidæ*),' by H. F. Barnes and C. L. Walton: ' Notes on Predaceous *Anthomyiidæ* and *Cordyluridæ* (Diptera),' by B. M. Hobby, (with figures) ; ' On Two Species of *Eosentomon* Berl. (*Protura*) New to the British Fauna,' by R. S. Bagnall, and several short notes.

*The Entomologist's Monthly Magazine* for September contains ' Systematic Notes upon British Aquatic Coleoptera,' by F. Balfour-Browne (Oreodytes and Graptodytes with figures) ; ' *Ebæus abietinus* Abeille (Malachiidæ, Col) new to Britain,' by H. Donisthorpe and J. R. le B. Tomlin (three females by sweeping under oak trees in Herefordshire) ; ' New Irish Coleoptera with Description of a New aberration,' by E. O'Mahony (*Anisotoma humeralis* Fab. *ab. orca. nov.*) ; ' On the Genotypes of British Carabidæ,' by H. E. Andrewes ; ' New or little known British Sawflies (Hymenoptera, *Symphyta*),' by R. B. Benson (new to Britain are *Pelmatopus enslini*, *Pteronidea brevivalvis*, *Lygæonematus strandi* and *pachyvalvis* and *Blasticotoma filiceti*) ; ' The Parasites of British Birds and Mammals, II. Records of *Ixodoidea* (Tick.)' by G. B. Thompson; ' The Times of Emergence and Forms of *Pieris rapæ* at Philadelphia, U.S.A.,' by O. Querci and several short notes of interest.

The *Journal of Conchology* for June contains the Presidential address of J. E. Cooper on the ' Oldhaven and Thanet Sand Mollusca of Herne Bay.' It was a most interesting account of his observations which he delivered at the Annual Meeting held in the rooms of the Royal Society, Burlington House, London. R. Winckworth gives a further contribution on the ' Names of British Mollusca ' ; ' A New Species of Goniodoris from South Africa,' by K. H. Barnard, D.Sc., F.L.S. ; ' *Limapontia depressa* (A and H.) v. nov. in Scotland,' by D. K. Kevan is worthy of note, while Miss Nora Fisher contributes a note on ' The Habitat of *Facelina drummondi* (A and H.).' The August number of the Journal contains several articles of exceptional interest ; ' *Genital Dimorphism* in Zonitoides,' by Hugh Watson ; Miss T. von B. Jutting writes on

'*Achatina fulica* (Fèr) in the Netherlands, East Indies' ; '*Cyppræa vinosa*, Gmelin, in a Saxon Woman's Grave in Somerset,' by Dr. J. W. Jackson ; 'Names of British Mollusca III,' by R. Winckworth. The article by Rodger Waterston on 'The Occurrence of *Amnicola taylori*,' and '*Bithynia leachii* in Scotland,' and also 'The Colouration of *Nucella lapillus*, L.,' by Guy L. Wilkins open up problems of great interest.

The *Entomologist* for October contains '*Tinea cloacella* Haw., *T. granella* Linn., *T. ruricolella* Staint., *T. cochylidella* Staint., and *T. personella* sp. nov." by F. N. Pierce and J. W. Metcalfe ; 'A Catalogue of the Noctuæ of Ireland,' by Lt.-Col. C. Donovan ; 'A Note on the Dates of Hübner's plates,' by J. G. Higgins ; 'Supplementary Note on the Dates of the Plates of the Papiliones in Jacob Hübner's Sammlung Europaischer Schmetterlinge,' by F. Hemming ; 'The genus *Prepona*,' by W. G. Sheldon ; 'Indo-Australian Hesperiidæ ; descriptions of new genera, species, and subspecies,' by Brig. W. H. Evans ; 'A new species of *Nysius* Dall. (Heteroptera, Lygæidæ) from West Africa,' by W. E. China, and numerous notes and observations.

The *Entomologist's Monthly Magazine* for October contains 'The Times of Emergence and Forms of *Pieris rapæ* at Philadelphia, U.S.A.,' by O. Querci (with diagram) ; 'Systematic Notes upon British Aquatic Coleoptera,' by F. Balfour-Browne (*Suphrodytes, Scarodytes*, and *Hydroporus* s. str. and *Laccornis* with figures) ; 'Some new and unrecorded aberrations of British Coleoptera,' by Horace Donisthorpe ; '' Coleoptera taken in the air at Wicken Fen,' by J. Omer-Cooper and Rev. C. E. Tottenham ; 'New African Asilidæ (Dipt.),' by B. M. Hobby ; 'Notes on some generic names of Odonata,' by J. Cowley, and several short notes.

*The Journal of the Society for British Entomology*, Vol. I, Part 2, contains numerous more or less short articles on British Entomology. Among these may be noted '*Ecphoropsis vexans* Hlmgr., an Ichneumonid (Hym.) new to Britain,' by A. H. Sperring (bred from larvæ of *Acosmetia caliginosa* in South Hants.) ; '*Microsania pectinipennis* Mg. (Dipt. Platypezidæ) attracted to bonfire smoke ' and 'Some further records of '' Smoke flies '' (Dipt. Platypezidæ),' by F. W. Edwards ; 'Diptera on Grassholm Island, Pembrokeshire,' by F. W. Edwards ; 'Predaceous Diptera and their Prey,' by B. M. Hobby ; 'What is *Phryganea bicaudata* of Linne?' by K. J. Morton ; 'Habits of the larvæ of *Hydroptilidæ* (Trichoptera),' by K. J. Morton ; '*Empis livida* Linn. (Dipt. Empid.) as a factor in the control of *Tortrix viridana* Linn. (Lep. Tortr.),' by E. R. Goffe ; 'Ejected Dipterous prey on *Metacrabro quadricinctus* F. (Hym. Crabronidæ),' by G. M. Spooner ; 'Coccidæ (Hemipt.) taken in Dorset and Surrey,' by F. J. Killington and '*Araujia sericifera* Brot. and its insect visitors,' by C. Nicholson (with figures).

## NORTHERN NEWS.

Mr. F. C. Fraser is carrying on the work of recording stranded Cetaceans round the British Coast which was commenced by Sir Sidney Harmer. The British Museum (Natural History) has recently issued the Report for the years 1927 to 1932 (No. 11, 41 pp., price 5/-). Perhaps the most generally interesting item is the description of the remarkable shoal of about 150 of the False Killer, *Pseudorca crassidens*, which occurred at Dornoch Firth in 1927. Previously this species was not recorded for British waters. One of the skeletons has been sent to the Museum at Hull.

There are six maps with the report showing that in the Northern Counties a large number of records of the common porpoise occur ; a few of the White-beaked Dolphin and White-sided Dolphin ; the Killer ; Bottle-nosed Whale, Sowerby's Whale ; and the Lesser Rorqual.

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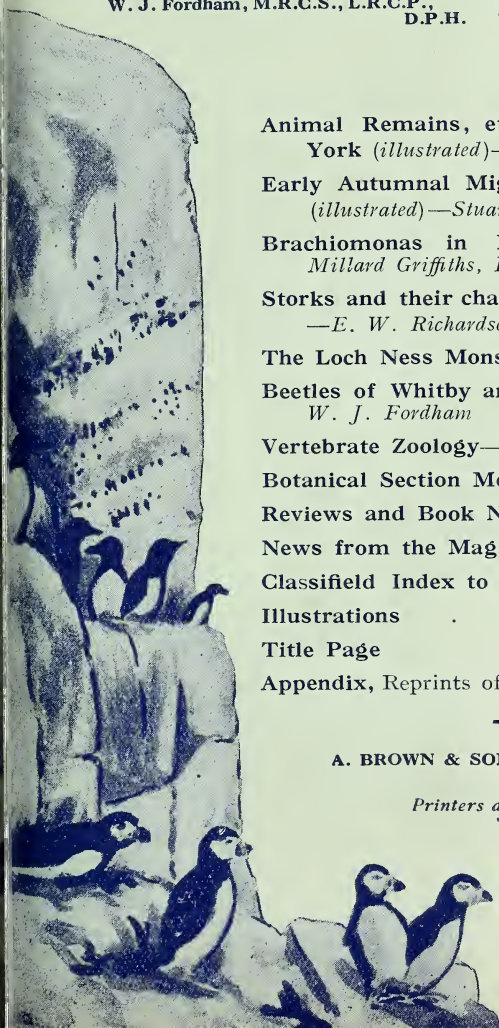

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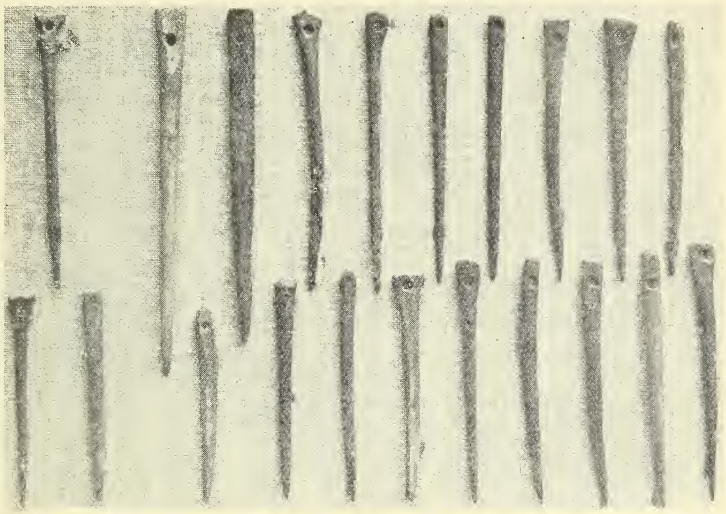
T. SHEPPARD, M.Sc., F.Z.S.

During the excavations in High Ousegate, York, in 1903, the work was carefully watched by the late William Hewitt of York, a well-known collector, and eventually his collection of Prehistoric, Roman, and Medieval remains came to the Museum at Hull. These have recently been placed on exhibition in the Mortimer Museum. Among the specimens are :—

Twenty-one needles, varying in length from $5\frac{3}{8}$ ins.



**Bone needles, many probably made from the ulnar bones of hare.**

to $2\frac{5}{8}$ ins. These are principally of bone, and occasionally of ivory, some of the former being curved, suggesting they were made from the ulnar bone of a hare.

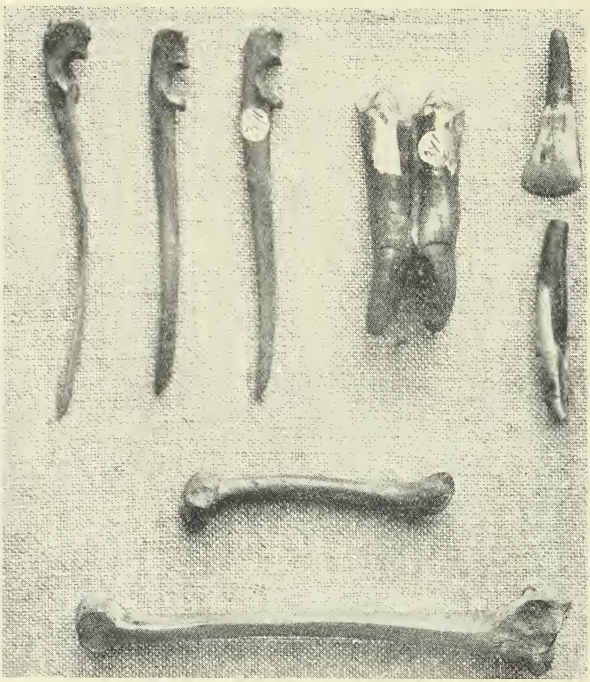
There are also fifteen pins of bone, or ivory, varying in length from $4\frac{1}{2}$ ins. to $1\frac{3}{4}$ ins. Three are plain, and cylindrical in section, the remainder being variously decorated at the head.

There is apparently a comb case $5\frac{1}{4}$ ins. long, a hollow tube with a deep groove cut in the centre as though used as a holder, a smaller tube which, as with the last, has been made from a mammal bone; two hone-stones or sharpeners, with perforations for hanging. A tine of a red deer antler which has been sawn off and sharpened to a square point, and an amber pendant, square in section, $1\frac{1}{2}$ ins. long, perforated for suspension, are among the collection.

There are spindle whorls, one of slate being elaborately decorated with concentric rings on the convex side. The

other three are of chalk. There are two massive jet rings, and a small red terra-cotta mask with a face and head-dress, almost Egyptian in style.

Of especial interest are three carved pins which are sufficiently intact to indicate that each is the ulnar (one of the arm bones) of a hare, and probably a number of the other carved pins and needles are made from similar bones.



**Ulnar bones of hare, teeth of ox, horse and pig, and (below) tibia and femur of the domestic fowl, *Gallus domesticus*.**

The other two specimens represent the tibia and femur of the domestic fowl, *Gallus domesticus*. In *The Ibis* for April last, Mr. P. R. Lowe discusses the question as to whether the domestic fowl was an occupant of Britain in Pre-Roman times. Previously this was doubted, as indeed at one time there was little evidence that it could be Roman. Mr. Lowe demonstrates from his researches that the fowl was indigenous in Britain, and was also occasionally found among Roman remains, so that these two bones from York seem to confirm Mr. Lowe's observations.

Among other bones found during these excavations were those of pig, ox, red deer, and horse.

# EARLY AUTUMNAL MIGRATION ON THE EAST COAST.

STUART SMITH, B.Sc.

THAT there should be considerable evidences of migrational movements so early in the season as the first weeks of August may perplex the casual observer of birds inland, to whom the autumn migration conjures up scenes of late September and early October ; of leaves turning from green to gold, and predominantly, perhaps, of the departure of the Swallow

tribe. To be sure, the Swifts leave early in August, but it is significant that this is regarded as something unusual and to a great extent inexplicable, and to talk of migration while the House Martins are still feeding their second or third brood beneath the eaves may appear grossly premature. Yet it is a fact that, by the end of July, the migrational impulse has begun to make itself felt, and nowhere this season are its effects more in evidence than on our eastern sea-board.

*1934 Dec. 1*

Here, during the last week of July and on through August, there appear on the sandflats and shores many 'waders,' which we know nest only in circum-polar regions of the highest latitudes. These 'passage-migrants' are, at this time of the year, mostly immature birds, and it must always be one of the marvels of migration that these same birds, hatched from the egg in far off Novaya Zemblya and the tundras of Arctic Siberia, should appear on our coasts but six short weeks after they have emerged from the shell.

At the same time many of our home-bred birds are on the move. Curlew, Golden and Green Plover from the Pennine Moors, and Dunlin and Dotterel from the Scottish mountain-tops are all leaving their nesting grounds for the estuaries and flats of the coast. There is thus a considerable amount of movement taking place among the birds, which, while it may not rival the great 'rushes' of the later season, is yet sufficient to keep any observer busy. The following notes were made during August 5th to 18th of this year on the south-east side of the Wash.

The Wash itself, with its immense tidal-flats, is an ideal area on which to study migrational movements, but it is important to keep its peculiar configuration clear in the mind. Thus the eastern side, from King's Lynn to Hunstanton, faces almost due west, and is, in fact, the only place on the east coast where 'the sun sinks into the sea.' This eastern side is one of the main routes of migration from the North Sea, and migrants hitting the coast further east at places like Cley and Cromer, often come on round the shoulder of Norfolk, before turning S.S.W. at Hunstanton, and thus at the former places may appear to be migrating in a N.W. direction! (*vide* B. B. Riviere, *British Birds*, vol VIII, p. 170.) Conversely, migrants from the north passing along the Lincolnshire side, often follow the coast right round and may be seen at such places as Hunstanton going N.N.E. before turning E. at Brancaster. Other birds again, leave the Lincolnshire coast near Skegness, come straight across towards Scolt Head, and then join the coasting stream making for the mouth of the Ouse. It is possible, however, to get a clear idea of what is taking place, by making observations near the point where the coast line turns from west to S.S.W., that is at Hunstanton Point, and it was near this point that these notes were compiled. The main routes are indicated in the accompanying map.

## Birds Observed.

Waders (*Limicolæ*).—During the whole fortnight (August 5th to 18th) Waders were arriving and moving on in ever-increasing numbers. On August 5th, the wind being

S.E. and light, Dunlin (*Erolia a. alpira*), Turnstones (*Strepsilas interpres*), and Ringed Plover (*Ægialitis hiaticula*) were seen in small numbers, most being birds of the year, or adults in transition plumage, but a single flock of Dunlin contained birds all in full breeding plumage, while in the evening there appeared three Turnstones still with very bright ' black and white ' about the head. On August 7th, the wind swung round to the N.E. and freshened considerably, blowing straight in off the open sea, and the number of Waders increased considerably. Many Turnstone, all immature, appeared and with them three Knot (*Tringa canutus*) in bright russet breeding plumage. Many Redshank (*T. calidris* came in during the night, and were seen next day feeding on the low tide flats. One particularly dark bird which stood out from the rest appeared referable to the Spotted or Dusky form (*T. erythropus*), but the lighting was not sufficiently good to render identification positive.

The first Sanderling (*Calidris arenaria*) was observed on August 12th, the bird being almost in complete winter plumage, but on the 14th, after a strong N.W. gale, several flocks containing both immature birds and adults in transition plumage appeared. All these Waders hung about until the 17th, when, after a fine warm night with a slight S.W. wind, many must have passed on, as their numbers were considerably reduced. Waders appear to use the coastal route leading towards the mouth of the River Ouse, although being night migrants one can only deduce this by the general ' drift ' they show while feeding.

Curlew (*Numenius a. arquata*), however, strike straight across the sea. They were first observed in considerable numbers on August 10th—a day of high S.W. wind—although a few birds had been about for several days. On that day, flocks passed from day-break until about ten a.m. They appear always to follow the same route, practically a straight line from Hunstanton to the Boston Stump, which can be dimly seen across the water. During the night of August 15th, following a strong N.W. wind the day previous, Curlews could be heard passing overhead long before the sun rose, and a considerable movement must have taken place, for flocks were observed continuously until nine o'clock that morning.

Green Plover (*Vanellus vulgaris*).—Flocks of young lapwing were in evidence in varying numbers during the whole fortnight. They habitually used the same direct route across the sea as the Curlews. This must be their normal habit, as I have never observed any ' coasting ' by these birds either

here or on the south coast. They generally appear soon after day-break, and seem to leave on all their migrations just before sun-down, and to be strictly nocturnal migrants.

Hirundines.—All members of the Swallow tribe were much in evidence, the flocks being composed almost entirely of birds of the year. Their movements were particularly interesting owing to the extreme susceptibility they showed to the direction of the wind. They appear loathe to migrate *with* a following wind if it has any real force, and as a consequence their route is often reversed. Thus on August 5th and 6th, the wind being southerly and light, Swallows (*Hirundo* r. *rustica*), House Martins (*Delichon* r. *urbica*), and Sand Martins (*Riparia* r. *reparia*) passed continuously along the coastal route towards the mouth of the Great Ouse. On August 7th, however, the wind swung right round during the night to N.E. and freshened considerably. All the Swallows and Martins then followed an exactly opposite route *up* the coast, in a N.N.E. direction and round, although what direction they took when it became necessary to turn south again is not known. On this day, the number of Sand Martins was very great. As the day wore on, their numbers increased, and many of the birds seemed extremely fatigued. They rested continuously on the sands, snapping up insects from the surface at the same time. The wind did not change in direction until the 9th, when it turned again to W.S.W., although retaining its strong character, and the direction of Swallow migration changed at once to the original route *down* the coast. The wind remained steady, in the S.W. quarter, although backing to W. occasionally, until August 14th, when it was once again N.W., and fresh, and the Swallows back on their ' up-coast ' route again. On August 17th, there was a particularly large movement of immature House Martins. These, as well as the young Swallows, can readily be told by their short stumpy tails compared with the adult bird.

Swifts (*Apus. a. apus*) on the other hand appear to be quite unaffected by wind direction, since they always follow the one coastal route downwards towards the Ouse mouth, regardless of the wind's direction or force. On August 5th packs were passing continuously along the coast, from 7 p.m. till dark. Swifts appear on migration more frequently in the evening, and possibly they may continue their migrations on during the night, as distinct from the Swallows, which are strictly day migrants. When the wind changed to N.E. their numbers fell at once, although such as did pass still kept to the same route, but on August 17th

after a warm day and light S.W. wind, the evening sky was at times black with passing Swifts. Among a large flock on this day were seen three Alpine Swifts (*Apus melba*) whose larger wing span, and white bibs and under parts were plainly visible in the low light of the evening sun.

Oyster Catchers (*Haematopus o. ostralegus*).—The oyster catchers were packing in ever-increasing numbers, until, on August 12th, there were 355 in one large flock resting on the low-tide sands. As the tide came in, the flock broke up and most of the birds dispersed in a S.S.W. direction along the coast. On August 14th, however, flocks were passing continuously at dusk in the direction of Scolt Head, and appart from a definite and continuous increase in numbers and a tendency to pack closer, it would be unwise to assume any evidences of a definite migrational movement of these birds at this time.

Terns.—Common Terns (*Sterna hirundo*), Lesser Terns (*S. a. albifrons*) and Sandwich Terns (*S. s. sandvicensis*) were all very much in evidence. On August 12th a large movement of common Terns took place, the birds passing at a great height and only their cries attracting attention at first. Through binoculars they could be seen drifting along the coast in a southerly direction.

Lesser Terns passed on the 7th and 8th, and again in considerable numbers on the 12th. They have no direct or purposeful migrational flight, but drift along in small parties, fishing as they go. These groups contain young and old birds, the latter often feeding the young, and their movements have to be closely watched for some time before the definite southerly trend in them is evident.

Common Scoter (*Œdenua n. nigra*).—These first appeared on the evening of August 7th, after the strong N.E. gale already referred to. This wind blew straight into the Wash, and the Scoter came in with it. A flock of seven was noticed on that day and later these were augmented until by the 14th August about fifty were out at sea. They flew about restlessly at times, and were no doubt too close in-shore for their liking.

Common Sheld Duck (*Tadorna tadorna*).—Small flock of four sheldrake on August 15th, and five more on the 16th.

Lesser Black Backed Gull (*Larus fuscus affinis*).—There were several about during the first week, after which an influx occurred on August 15th and there was large flocks on the flats when observation ceased on August 18th.

# BRACHIOMONAS IN NORTHUMBERLAND.

BENJAMIN MILLARD GRIFFITHS, D.Sc.

In September, 1934, the writer noticed a green discoloration of the water in a small rock-pool situated on a cliff of horizontally-bedded Coal Measure sandstone at Seaton Sluice on the coast of Northumberland. The pool was about two feet in diameter and six inches deep, and lay about eight feet above high-tide level, but within reach of wind-blown spray. Examination of the water revealed a practically pure collection of *Brachiomonas submarina* Bohlin.

*Brachiomonas* is a unicellular biciliate alga allied to *Chlamydomonas*, but the cell wall instead of being smooth and rounded is drawn out in its upper part into four lateral angles or horns which are directed backwards, and the base of the cell is prolonged into a large posterior axial horn. The alga normally inhabits brackish water, particularly in rainwater rock pools which are above high-tide mark but are within reach of an occasional sprinkle of spray. Pascher (Susswasserflora, 4, Volvocales, 1927, p. 343) distinguishes four species : *B. simplex* Hazen, with very slightly developed lateral horns ; *B. submarina* Bohlin, with stout, well-developed horns ; *B. gracilis* Bohlin, with more slender horns ; and *B. Westiana* Pascher with stout, slightly recurved horns. The genus is widely spread, but is sporadic and easily overlooked. It is recorded for the shores of Northern Europe, Corsica, the Black Sea, and North America.

*B. Westiana* was originally described by G. S. West (*Journ. Linn. Soc.*, 37, 1908, p. 281) under the name of *B. submarina* Bohlin, but with the caution that the characters were not quite the same as those of Bohlin's species. West's alga was obtained from brackish marshes at Sheerness, Kent, and was the first record for this country. In July, 1920, Hazen (*Bull. Torrey Bot. Club*, 49, 1922, p. 75-92) found *B. submarina* (including forms similar to West's) and *B. simplex* at Cullercoate, Northumberland, a few miles south of Seaton Sluice. In 1922, Neilson Jones (*Proc. Linn. Soc.*, 1922, p. 57) recorded *B. submarina* from a partly dried up freshwater garden pool in London.

The Seaton Sluice species was *Brachiomonas submarina* Bohlin and not *B. Westiana* Pascher. Asexual and sexual stages were present. In the asexual division four zoospores were formed. Each zoospore had a chloroplast extending into the horns, and the extension was maintained in the adult stage up to the time of zoospore formation, when there was a contraction of the cell contents into a rounded mass previous to the cleavage into four zoospores. In the sexual reproduction the cell contents divided into sixteen biciliated

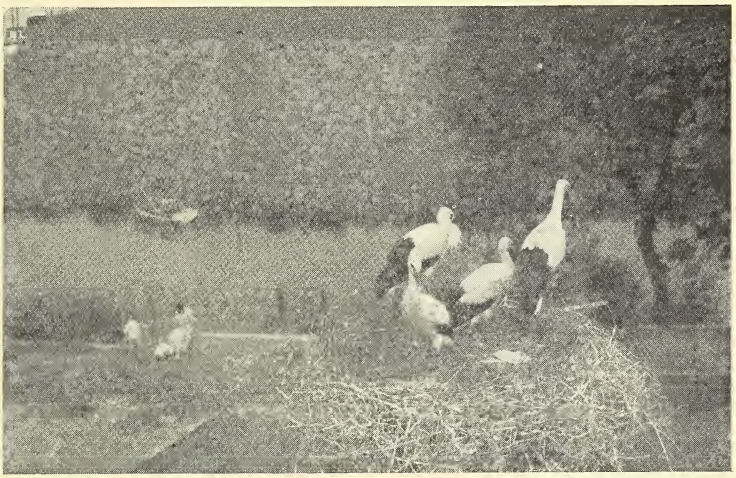
gametes which differed from the zoospores in being much smaller in size and the horns very much reduced. The zygotes were quadriciliate and elongated-ovoid in shape. The final stage of the rounded-off zygospore was not observed.

## STORKS AND THEIR CHANGE OF DOMICILE.

E. W. RICHARDSON, F.R.G.S.

### Increased Numbers Noted in Denmark.

In view of the gradual but marked disappearance from



**A Family of Storks at Ribe, Jutland.**

Northern Europe to other countries of the stork, the accompanying picture of a stork's nest in Denmark will be of interest to many readers. The photograph was taken near the old-world town of Ribe, in South Jutland. Here, the inhabitants used to erect tiny platforms on the roofs or step-gables of their houses for the storks to build their nests on. There is quite a large platform on the roof of the Town House at Ribe, which until this season had long been uninhabited.

This season, for some unknown reason, storks have built their nests in greater numbers than usual all over Denmark. For some time this gradual increase has been noted, especially near Ribe and Randers. But this year the storks have also built at Kristrup, Hornbaek, Vestru, Ejbaek, Dronningborg, Udbyhoj, Allingaabro, and many other places in Jutland. So great is the pressure upon eligible sites that many young

couples have been unable to find a nesting place, although the old birds have taken up their quarters in their former homes. At Albaek a remarkable pair of storks regularly, each year, bring up a nestful of five or six young, though the average family is less, the number of eggs laid generally being four.

One reason for the diminution of storks in Europe is said to be their love of locusts, which leads to their eating those killed in countries by arsenic poisoning during a plague. Drainage of marsh-land is also contributory. In a hot summer, when marshes and bogs are caked and dried, the birds get little food, and cannot bring up a brood. It is probable that, having once experienced such conditions, the storks will not return to the same neighbourhood the following summer : *ciconia alba*, like other birds, has a good memory for feeding-places.

## THE LOCH NESS MONSTER.

It will be remembered that from time to time reports of the Loch Ness Monster have appeared in the press and even some plaster casts of its footprints were sent to the British Museum for examination. These proved to be impressions made by a ' stuffed ' foot of a hippopotamus. It will also be remembered that the Hull Museums' Director (Mr. T. Sheppard) made some footprints in the sands at Spurn from a large elephant foot which he uses as a wastepaper basket. At the Linnean Society's meeting in London recently held, a film of the Loch Ness Monster was shown. This proved that the animal is certainly a seal, which was Mr. Sheppard's suggestion many months ago. It is interesting to find this is confirmed.

## NEWS FROM THE MAGAZINES.

*The New Phytologist* for October contains ' A study of the respiration of conjugating *Spirogyra*,' by N. L. Pal ; ' The Spore discharge mechanism in *Basidiobolus ranarum*,' by C. T. Ingold ; ' Comments on recent statements regarding the nature and origin of the Angiospermic stigma,' by J. McLean Thompson ; ' Substitution Staining with free dye acids and dye bases,' by R. C. McLean ; and an article which should be studied by all interested in peat on ' Pollen Analysis—technique and interpretation,' by H. Godwin.

*The Entomologist's Record* for October contains ' Lepidoptera at Jaca, Spain, in August, 1931 and 1933,' by W. Fassnidge ; ' The Cottian Alps and Turin in June-July, 1933,' by the Rev. E. B. Ashby ; ' Geometers at Storrington, W. Sussex,' by G. S. Robertson ; ' Nomenclature, The List,' by H. J. Turner ; ' *Psylla ptarmicae* Kieff. as British,' by R. S. Bagnall ; and several ' Notes on Collecting,' including a record of the orthopteron *Phasgonura viridissima* from Hexham. There are also supplements : ' British Noctuae,' by H. J. Turner, and ' Butterflies of the Upper Rhone Valley,' by R. Verity.

# BEETLES OF WHITBY AND DISTRICT.

H. BRITTEN AND W. J. FORDHAM.

THE following is a list of beetles taken mainly within a radius of twelve miles around Whitby by one of the writers (H. Britten). It contains records of seven species new to the county of Yorkshire and three new to vice-county 62 (North-East Yorkshire). The Whitby district has apparently, of recent years, been somewhat neglected by coleopterists, but if thoroughly worked there is no reason why it should not be as rich in beetles as the Scarborough district, which has been well worked and provides many rare species. A large number of generally common beetles have been taken which are not included in this list. The rarity or otherwise in the county of Yorkshire of the species noted is given in brackets following the name.

*Notiophilus hypocrita* Putz. (Rare). Danby Moor, 19/5/34, under stones. This species which Fowler considers may be a race of *palustris* Duft., is widely distributed but local over the British Isles. It has only so far been taken in Yorks. in the Scarborough district.

*Bradycellus distinctus* Dj. (New to Yorks.). Upgang, 14/4/34. Previous Yorkshire records of this species probably refer to *sharpi* Joy. The true species has so far only been recorded from the south of England.

*Amara ovata* F. (Rare). Whitby, 10/5/34. This species has been taken in the Scarborough district by Mr. Bayford.

*Bembidion nigricorne* Gyll. (Local on moors of N. and W.). Hole of Horcum, 26/8/34; abundant under heather. Previously taken at Robin Hood's Bay (Y.N.U.) and Ravenscar (W.J.F.).

*B. redtenbacheri* K. Daniel. (Rare). Raithwaite, 3/5/34. Frequent under stones near the stream side. This beetle was added to the British list a few years ago by Dr. Joy on specimens taken near Sheffield. It has since occurred at several places in the county.

*Haliplus wehnckei* Gerh. (New to Yorks.). Whitby, 21/3/34. A widely-distributed species occurring in Cumberland, Durham, and Lancashire and Cheshire.

*Atheta luridipennis* Mann. (Rare). Raithwaite, 3/5/34. Only found in Yorks. at Scarborough by Lawson and at Heaton Wood by Mr. Stringer.

*Encephalus complicans* West. (Very local). Mulgrave Woods, 16/7/34.

*Mycetoporus longulus* Mann. (Local). Whitby, 28/5/34.

*M. splendidus* Gr. (Rare). Goathland, 11/7/34.

*Philonthus trossulus* Nord. (Rare). Skelder Wood, 12/5/34. Most of the Yorks. records of this species refer to *pennatus* Shp. The true species is recorded from North Cave, Eston Nab, and Askham Bog.

*P. velox* Shp. (New to Yorks.). Upgang, 14/4/34. This species is sparingly distributed from the South of England to South Scotland and has been taken in Durham.

*Oxytelus fairmairei* Pand. (New to Yorks.). Hole of Horcum, 26/8/34; frequent in sheep dung; widely distributed over Britain but sparingly.

*Syntomium aeneum* Mull. (Local). Sandsend, 15/7/34. E. W. Aubrook

*Coprophilus striatulus* F. (Local). Whitby, 10/5/34. This species is frequently found on pathways in the spring.

*Hypocyptus apicalis* Bris. (New to Yorks.). Mulgrave Woods, 16/7/34. A rare species found in Cumberland in ivy on old walls.

*Xylodromus depressus* Gr. (Very local). Mulgrave Woods, 16/7/34.

*Calyptomerus dubius* Marsh. (New to Yorks.). Sandsend, 15/7/34. Widely distributed and frequently found in haystacks. Recorded from several of the northern counties and the Isle of Man.

*Agathidium laevigatum* Er. (Rare). Sandsend, 15/7/34. Only recorded from Blackmoor, near Leeds, and Saltburn.

*Neuraphes angulatus* Mull. (Very local). Sandsend, 15/7/34. Only found at Saltburn. Occasionally in mole's nests.

*Stenichnus collaris* Mull. (Uncommon). Mulgrave Woods, 28/3/34.

*S. exilis* Er. (Very local). Upgang, 15/7/34. E. W. Aubrook. Generally found under bark, occasionally with ants.

*Bythinus macropalpus* Aube. (Rare). Mulgrave Woods, 16/7/34. The male of this species is very rare.

*Cerylon ferrugineum* Steph. (Rare). Sandsend, 15/7/34. E. W. Aubrook. Frequently found under dead poplar bark.

*Hister 12-striatus* Schk. (Not uncommon). Whitby, 10/5/34.

*Cateretes rufilabris* Lat. (Local). Upgang, 15/7/34. This species was first recorded in Yorks. from *junci* near Hull by Samouelle in 1824.

*Epuraea longula* Er. (Rare). Sandsend, 21/7/34. Only recorded from Grassington.

*Cryptophagus acutangulus* Gyll. (Rare). Whitby, 14/2/34. 15/4/34. Present in house in large numbers in February and during most of the season. Specimens could be obtained living on the white fungus like growth on the walls. Very common in new houses.

*Atomaria bicolor* Er. (Local). Sandsend, 21/7/34. Only recorded from Flamborough and Scarborough.

*Ephistemus globulus* Pk. (Local). Raithwaite, 21/7/34.

*Aphodius foetens* F. (Local but widespread). Newholm, 14/7/34. Abundant in horse dung.

*A. putridus* Hbst. (Not uncommon on the moors of the North). Hole of Horcum, 26/8/34. Abundant in sheep dung.

*Oxyomus silvestris* Lap. (Very local). Whitby, 10/5/34. Only recorded from Scarborough and Thorne Moor.

*Agriotes acuminatus* Steph. (Local). Sandsend, 3/6/34.

*Cyphon ochraceus* Steph. (Local). Sandsend, 15/7/34.

*Eubria palustris* Germ. (Rare). Sandsend, 15/7/34. Only recorded from Scarborough.

*Necrobia violacea* L. (Very local). Mulgrave Woods, 16/7/34. New to V.C. 62. Occurs in carrion.

*N. rufipes* D.G. (Very local). Mulgrave Woods, 16/7/34.

*Lyctus linearis* Goeze. (Rare). Whitby, 22/7/34. Egton Bridge, 30/6/34; in large numbers in house at Whitby and several specimens at Egton Bridge. New to V.C. 62. Only recorded from Barnsley.

*Phytodecta pallida* L. (Local). Levisham, 4/8/34.

*Phyllotreta exclamationis* Thun. (Rare). Mulgrave Woods, 16/7/34. E. W. Aubrook. New to V.C. 62.

*Epitrix atropae* Foud. (New to Yorks.). Dowthwaite Dale, 2/9/34. Kirby Moorside, swarming on *Atropa belladonna*. This is apparently the most northerly station in Britain and a considerable extension of its range. It is a very local species, but is found in profusion where it occurs.

*Barynotus squamosus* var. *schonherri* Ztt. (Very local). Whitby, 21/3/34. A northern species.

*Sitona flavescens* Marsh. (Local). Whitby, 15/4/34. Levisham, 4/8/34.
*Phytonomus trilineatus* Marsh. (Very local). Sandsend, 21/7/34. Only recorded from Filey and Saltburn.
*Dorytomus melanophthalmus* Pk. (Rare). Sandsend, 15/7/34. Only recorded from Bubwith and the Scarborough district.
*Cionus alauda* Hbst. (Rather local). Sandsend, 15/7/34. Ruswarp, 27/6/34 ; Mulgrave Woods, 16/7/34 ; abundant at each locality with *C. scrophulariae* L.
*C. pulchellus* Hbst. (Local). Mulgrave Woods, 16/7/34.
*Hylastes opacus* Er. (Rare). Whitby, 8/6/34. Only recorded from Wykeham.
*H. palliatus* Gyll. (Local). Whitby, 15/4/34.

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## VERTEBRATE ZOOLOGY.

E. WILFRED TAYLOR.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists Union was held in the library of the Leeds Church Institute on Saturday, October 20th, Mr. Rosse Butterfield occupying the chair.

The sectional meeting was preceded by meetings of the Yorkshire Wild Birds and Eggs Protection Acts Committee and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee.

At the sectional meeting the minutes of the previous meeting were read and confirmed, as also were the annual reports of the Divisional Officers of the North, East and West Ridings and of the York District. The Divisional Officers are Messrs. W. J. Clarke, C. W. Mason, H. B. Booth, and S. H. Smith.

The General and Financial reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee and the reports of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee were read and approved.

Alderman Albert Hirst, J.P., was elected President of the section for 1935.

Mr. F. H. Edmondson reported that he attended the Eighth International Ornithological Congress at Oxford as delegate of the Yorkshire Naturalists' Union, and that twenty-eight countries were represented. The lectures and debates were of a high order and the general arrangements, including the excursions, were very well organised.

Mr. G. R. Edwards gave a paper entitled ' With Temminck's Stint in Scotland,' in which he described the accidental flushing of a sitting bird from the rushy margin of a Scottish loch on June 13th of this year. At the time it was thought that the bird was a Dunlin, but it was possible on a subsequent occasion to obtain a better view of the bird, when certain peculiarities in its appearance and flight were noted. A severe thunderstorm led to the desertion of the nest, and the eggs, together with the notes, were forwarded to the Natural History Museum. The eggs were identified as those of Temminck's Stint and are the first to be obtained in the British Isles. The author and Mr. Crapnell, who accompanied him, were congratulated on a notable discovery.

Mr. S. H. Smith read a paper entitled ' The River Ouse and its Fishery Problems,' in which he first described the condition of our local rivers in the fourteenth century, when considerable attention was given to the inland fisheries and coarse fish of all kinds were plentiful. Chemical pollution was then unknown and special laws were enacted to control the domestic pollution. In those far-off days the river was little disturbed

by the sailing and horse-drawn craft, the weed beds and quiet backwaters produced an abundance of food and the migratory fish met with no obstruction as they made their way to and from the spawning beds.

To-day our local rivers are obstructed throughout their course by weirs and locks, built either to facilitate navigation or to obtain a head of water for working mills. The water is free from the type of nitrogenous pollution prevalent in the fourteenth century, but far more deadly chemical effluents are present from dye works, mills, and from the use of chemical fertilisers on the land. In addition, the shallow portions of the river have been dredged, the banks have been straightened, the weed beds cleared away, and the natural food supply of the fish greatly reduced with the inevitable result that the quantity of fish has steadily diminished. In addition, the big catchment boards and their subsidiary local drainage authorities have concentrated on the clearing of ditches, drains, and watercourses flowing into the main streams with the result that after heavy rain the flood water passes quickly into the main river which rises rapidly and carries away fish ova, fish fry, and much of the food supply.

The number of elvers and lampreys ascending the river have been greatly reduced and although a definite spring and autumn run of salmon still takes place, the numbers have greatly diminished. Under unusually favourable circumstances the salmon running up the Ouse are able to surmount the weir at Naburn, but the necessary combination of a spring-tide with a flood water is rare, and in a dry season the salmon are checked below the fall, where they sicken and die without having reproduced their species in the headwaters of the river, and in so doing provided a potential food supply.

The construction of a fish pass at Naburn would, since one already exists at Linton, allow the salmon to proceed upstream to Topcliffe Weir, seven miles above the mouth of the Swale, when the provision of a further pass would open up many miles of new spawning ground in the Swale and tributaries. In a similar manner, fish passes at Sutton and Stamford Bridge on the Derwent would open up the headwaters of the Derwent, Rye, and Riccall with their tributary streams, so that great numbers of salmon could be reared at small expense.

In the meanwhile the Yorkshire Fishery Board is experimenting with the artificial introduction of salmon ova into the upper reaches of the Swale, and if the results warrant it the scheme may be extended in future years.

The lecture was illustrated by lantern slides of fresh-water fish and of the obstructions restricting their movements.

Mr. F. H. Edmondson read a paper entitled 'Animal Life of Central Africa,' and described how he and his companions had journeyed from the Cape to Cairo, largely by road, armed with a small cinematograph camera. It was found that the native birds and animals took little notice of a motor car, and that even the larger mammals could be approached without great difficulty if due attention was given to the direction of the wind. In this manner some remarkably fine photographs were obtained of most of the larger animals, including giraffe, hippopotamus, buffalo, wart hog, baboon, lion, zebra, and various species of gazelles and antelopes.

The bird life was also well represented and included the giant bustard, ostrich, fish eagle, secretary bird, marabou, and white-breasted stork, glossy ibis, egret, and weaver bird. A portion of the film dealt with a plague of locusts and showed several black kites wheeling backwards and forwards, catching locusts in their talons.

Photographs were also shown of the Penguin Rookeries on Dassen Island, and included the nesting burrows, the bathing parades, and the miseries of the moulting period when the birds are unable to obtain food for a period of about a month.

The third part of the lecture dealt with the bird life of the Bass Rock and Farne Islands, and also with the herd of wild cattle at Chillingham.

Finally, a vote of thanks to the lecturers and lanternists was proposed and carried unanimously.

## BOTANICAL SECTION MEETING.

CHRIS. A. CHEETHAM.

This meeting was held in the Botanical Department at Leeds University by the kind invitation of Prof. Priestley. At the business meeting in the afternoon the officers and members for the various committees were considered and suggestions forwarded for election at the annual meeting of the Union. The report of the Section was presented by the secretary. This was discussed and passed for publication, the convenors of the Records, Ecological and Bryological Committees also presented their reports, which were adopted. Suggestions were put forward for the Union's field meetings in 1935 for the consideration of the executive. A very welcome cup of tea was next supplied by the kindness of Mrs. Priestley, assisted by Miss L. Scott and other ladies, after which the President of the Union, Mr. F. A. Mason, showed a series of photographs illustrative of the fungus attacks on the Juniper and also showed under the microscope, and by means of paintings made by Miss Wooff, an uncommon type of fungus, *geoglossum*.

After this, the meeting visited the Botanical Museum, where Dr. Sledge had arranged and spoke about an exhibit of a collection of plants he had made on a recent visit to Sardinia. Returning to the lecture theatre, Dr. Pearsall gave a short talk on the effect of the two recent dry summers on the vegetation in Lake Windermere. He first pointed out how a series of yearly records have proved that wet years produce more algal plankton than dry summers and that this influences the depth to which light penetrates. Consequently, after a series of wet years, plants do not grow at so great a depth as they can and do grow at in a time of dry summers. He finds that the last two years have helped these plants to work back from the 13-foot level of 1932 towards the 20-foot level of 1907, which they are quickly approaching.

## REVIEWS AND BOOK NOTICES.

**Man versus Rabbit,** by **A. H. B. Kirkman,** Hon. Secretary for Wild Life, The University of London Animal Welfare Society, pp. vi+74. Published by the Society at 68 Torrington Square, London, W.C.1. Price 1/- post free. The second edition of this excellent monograph appears at just the right time. A bill for the abolition of gin traps, promoted by the Society with the support of other organisations, will be introduced into the House of Lords at an early date by Lord Tredegar, and if all members of the legislature could read this book beforehand the bill would quickly become law. The case against gin trapping on the score of cruelty is quite convincing, and the author makes it very clear that other methods of dealing with the so-called vermin are better from every point of view. In any case, a method which allows of a trapped animal dying slowly and in agony is quite inconsistent with modern standards of humanity, and if the facts could be sufficiently widely known, the barbarity of the steel trap would not be tolerated for a day longer. The sponsors of this manual have our very best wishes and full support.

**Green Fields and Fantasy,** by **Patrick R. Chalmers,** illustrated by G. E. Collins, pp. 98, 12 collotype plates and 30 line illustrations, 8/6 net. (Methuen). This is a beautiful book—its subject adequately

described by its title—a collection of light essays, stories, and poems about the countryside. It is illustrated by drawings which possess a rare distinction of line, which all reach a very high standard, and one or two of which are real gems. Some of the bird studies are in the same class as those of E. A. Wilson, of Antarctic fame, notably those of ' the wanton lapwing ' and of a thrush. ' Like Butterflies wings,' a butterfly on a dandelion, is equally striking. Of the stories, those about mist and the Imagination and the last wolf appealed particularly to the reviewer. This book would make a welcome present.

**Everyday Botany,** by **L. J. F. Brimble,** pp. 589, text figs. 340 (Macmillan and Co., Ltd.). This is an elementary text book of botany which is distinguished by the attempt to show how botany is related to everyday life. Every botanical feature or process is described, and then its bearings on human activities are indicated. The work has been adequately done on the whole, and the numerous illustrations are a particularly useful feature. There are, however, one or two statements which need qualification or revision, notably that on page 9, that ' in no circumstances are foods manufactured in Nature from the raw elements without the help of chlorophyll.'

**Insect Physiology,** by **V. B. Wigglesworth,** pp. 134, 13 text figs., price 3/6 net (Methuen and Co., Ltd.). This little book should be in the hands of every entomologist who is interested in how the insect organism works or in its relationship to its surroundings. It contains in a limited space an admirable summary of the working of the insect body and the processes involved. Different chapters deal with the integument, respiration, the circulatory system and blood, digestion, excretion, nutrition and metabolism, reproduction and growth, and, finally, the nervous system and behaviour. The mere list of headings alone, however, does not do justice either to the breadth of treatment or to its lucidity. The author is to be congratulated on a most successful review of his subject.

**Workers in the Wilds,** by **A. R. Dugmore,** pp. 192, 16 illustrations, price 5/- net (Herbert Jenkins). In this volume Major Dugmore continues his stories of wild life, by describing the life of beavers in Canada. In story form he gives a clear and full account of this interesting animal and its habits. The details are free from the exaggeration which has surrounded the habits of the beaver, and there are abundant signs of first-hand observation. The illustrations are from drawings by the author. The book is worth remembering for the Christmas season apart from its naturalistic interest.

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*The Entomologist* for November contains ' Winter Butterfly Holidays,' by W. G. Sheldon ; ' The types of some genera of Odonata,' by J. Cowley ; ' Migration Records,' by Capt. T. Dannreuther ; numerous notes and observations. *Plusia moneta* is recorded as far north as Morpeth and Carlisle, and a large swarm of the Cockchafer is reported from Abergavenny.

*The Entomologist's Monthly Magazine* for November contains ' Notes on some generic names of Odonata,' by J. Cowley ; ' Systematic notes upon British aquatic Coleoptera ' (with figures), by F. Balfour-Browne (*Hydroporus*) ; ' The puparium of Nycteribia (*Listropodia*) pedicularia Latr., with general remarks on this stage in Nycteribiidæ,' by H. Scott ; ' *Metrioptera roeselii* Hag. ab. diluta Charp,' by K. G. Blair ; and several short notes, including a record of *Dytiscus dimidiatus* Bergst. from South Wales. (This species has only formerly been recorded from Askham Bog, Wicken Fen, and Somerset.)

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COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators ; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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*Supplement to "The Naturalist," 1934.*

Circular No. 381.

# Yorkshire Naturalists' Union.

**President:**

F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**

CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**

S. D. PERSY FISHER, Sackville Street, Leeds.

**Local Secretary:**

G. B. WALSH, B.Sc., "Linthorpe" Stepney Drive, Scarborough.

## The 381st Meeting

WILL BE HELD AT

# FARNDALE

for the investigation of the area of the proposed new reservoir of the Hull City Corporation

## On Saturday, April 14th, 1934

**HEADQUARTERS.**—'Feversham Arms,' Farndale East, Kirby Moorside (Mrs. Mortimer). Meat tea, 1/6. Those intending to stay overnight should write here or to 'White Horse,' Kirby Moorside (Miss Elliott).

**TRAVEL FACILITIES.**—The area is remote from railway and ordinary bus routes. Members travelling by train should book to Pickering Station *via* Malton. A train leaves York at 10 a.m., arriving Pickering 11-4 a.m. Return train leaves Pickering 7-50 p.m., arriving York 9-3 p.m. Robinson's bus will meet the 11-4 a.m. at Pickering and convey passengers to Farndale, return fare 2/6.

Other members will join the party at Church houses, Farndale, at 12 noon. It will greatly facilitate arrangements if members will notify the Secretary if they require seats on the bus, and also all members who will be at the tea, as Farndale is a difficult place to provide for a large number at short notice.

**PERMISSION.**—The Earl of Feversham has kindly given permission to visit his estate.

**MAPS AND BOOKS.**—Map No. 22 of the 1 in. Ordnance Survey covers the district ; Kendall and Wroot's ' Geology of Yorkshire ' ; Elgee's ' Moorlands of N.E. Yorks.' ; and Baker's ' North Yorkshire ' may be consulted.

**ROUTE.**—The main object of the excursion is to investigate the fauna and flora of the area later to be covered by water under the Farndale Scheme of the Hull City Corporation. Mr. W. D. Bingham or Mr. T. H. Jones will lead the party and will address the members in the morning, describing the scheme from the engineering and geological aspects, and members will be provided with small sketch plans of the area.

The route will follow the stream up as far as the Corporation water will extend.

**FAUNA AND FLORA.**—Mr. G. B. Walsh writes : The district to be explored has never before been visited by the Yorkshire Naturalists' Union, and very little seems to be known of its fauna and flora ; it is rather late to see the daffodils at their best, and visitors are reminded that the plucking of the flowers and the uprooting of the plants are strictly prohibited. The countryside contains many trees, and is pleasantly diversified ; it will well repay careful investigation.

Mr. F. H. Mawson, of Farndale, writes : It is rather early in the season for most of the interesting plants and animals of

the dale, but on the banks of the Dove there can be seen Kingfishers, Sand Martins, Wagtails, Water Ouzel, Water Hen, Teal, and Heron. Snipe and Woodcock can be found on marshy ground. On the moors the usual small birds and Snow Bunting, Nightjar, Green Plover, Tawny, Barn and Long-eared Owls, and Kestrel, Sparrow Hawk, and Merlin. Golden Plover and Curlew nest on the moors. The Ruff and Reeve were found near a pool on the moor a few years ago, but they have not been seen since the pools were drained. The Grey Squirrel is plentiful, but the Red Squirrel is getting scarce, Foxes and Badger make their home on the moor.

Adders are plentiful on the moor, and some grass snakes and glow worms are seen in the fields. Amongst the plants to be found are the Brittle Bladder, Northern Hard, Oak, Beech, Spleenwort, Moonwort, and Adders Tongue ferns ; with Butterwort, Sundew, Butterfly Orchid, and Wild Daffodil.

**GEOLOGY.**—Dr. H. C. Versey, F.G.S., writes : The district and its geology, Farndale is one of the most attractive of the dales which have been carved by streams draining southwards from the high moors of North-east Yorkshire. The existence of the hard sandstones of the Estuarine Series resting on soft Liassic Shales has permitted the formation of a deep valley, but as the stream is now graded there is little indication of rock variation in the course of the stream. At the southern end of the dale the stream looses volume where it crosses the limestones of the Corallian. The area may be regarded as typical of Central Cleveland, and most of the Jurassic horizons show characters different from those visible on the coast.

This applies especially to the Middle Lias, Dogger, and Scarborough Limestone horizons, and special attention will be paid to each of these horizons. The moorlands above the dale form part of the peneplane of Tertiary erosion. Farndale is proposed by the Hull Corporation as the site of a new reservoir, and as in this event a large part of the dale would be flooded, it is very important that as many observations as possible should be made before opportunities fail.

A meat tea may be obtained at Headquarters at a charge of 1/6 per head, and will be served at 5-30 p.m.

---

**A GENERAL MEETING** will be held at 6-15 p.m.

# Yorkshire Naturalists' Union.

.....19.....

.....[*Signature and Titles.*]

.....

.....[*Address.*]

*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS* (15/-) *per annum until the end of the year in which written resignation is given.*

.....
.....
[*Signature of Proposer and Seconder.*]

*Elected*.....19 *at*.....

.....*Chairman's Signature.*



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YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, or to The Hon. Treasurer, S. D. Percy Fisher, Sackville Street, Leeds.*

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**This form, when filled up and signed, should be sent to the Hon. Secretary of the Union, accompanied by the amount of the first year's subscription.**

**The Subscription of 15/- entitles the members to receive the Union's monthly magazine, "The Naturalist," as well as the "Transactions."**

**Persons related to and resident in the family of a member are admitted as 5/- members, to enable them to attend excursions, but not to receive the publications.**

**Qualification for Life Membership :—A Donation of 11 Guineas.**

CIRCULAR No. 382.

# Yorkshire Naturalists' Union.

---

**President:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

**Local Secretary:**
J. HARTSHORN, Leyburn.

---

# The 382nd Meeting

WILL BE HELD AT

# ASKRIGG for SEMERWATER

## WHITSUNTIDE,

## MAY 19th - 21st, 1934

**Headquarters: Mrs. Thompson, Winnville, Askrigg, Yorks.**
**Terms: 9/- per day.**

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**TRAVEL FACILITIES.**

Leeds, 6-10 a.m. Bradford, 6-6 a.m. Askrigg, 10-56 a.m.
,, 4-3 p.m. ,, 3-38 p.m. ,, 7-2 p.m.
Northallerton, 10-58 a.m. Askrigg, 12-6 p.m.
,, 7-10 p.m. ,, 8-39 p.m.

There are 'bus services from Ripon and Northallerton.

**PERMISSION.**—The shooting tenant, Mr. Appleyard, in granting permission, asks that the party will have no dogs with them and that they will keep off the moors as the grouse will be nesting at the time of the excursion.

**ROUTE.**—The object of this excursion is to investigate and produce a report on the Semerdale area. On Saturday, the party will work up the River Bain ; then by the north side of the lake into Raydale. Members arriving by the 10-56 a.m. train will be met at the station ; others arriving by the 12-6 p.m. will overtake the party by taking the road *via* Bainbridge to Countersett.

On Monday the east and south of the lake will be followed into Cragdale ; thence to Stake Allotments for the *Ancient enclosures*, and to Addlebrough.

**MAPS AND BOOKS.**—Sheet 20 of the 1-inch Ordnance Survey covers the district. Baker's ' North Yorkshire,' Kendall and Wroot's ' Geology of Yorkshire,' and ' The Geology of the Yorkshire Dales,' in *Proc. Geol. Assoc.*, XLIV, 1933, p. 227, should be consulted.

**GEOLOGY.**—Dr. R. G. S. Hudson, F.G.S., writes : Raydale, commonly known as Semerdale, is, with its tributary dales, Bardale and Cragdale, of interest both for its glacial geology and for the good exposures of the Yoredale Series.

Since the beds dip slightly to the north, at first steeper and then less steep than the slope of the valley, an inlier of Great Scar Limestone forms the floor of the upper part of the dale. It is followed by the Yoredales, a rhythmic alternation of limestone, shale, and sandstone forming the characteristic ' step ' topography of the valley sides and the fine though little known waterfalls of Stallingbusk and Naked Dale. The Millstone Grit occurs immediately above the Main Limestone and forms the moorland of Middle Tongue.

A quarry on the right hand side of the road about 300 yards before Countersett exposes Gayle Lmst with abundant *Productus punctatus*. The Hardraw Scar is well seen on the other side of the valley at High Blean. North of Marsett, Ash Gill exposes the Simonstone and Middle Limestones. Fossils are abundant in the Gayle Shale of Raydale Wood, and good sections of Lower Yoredales are seen in the gills to the south of Raydale House.

Semerwater is a remnant of a much larger lake formed by the damning of the pre-glacial River Bain by a barrier of drift through which the river has now cut a gorge. Two of the many glacial overflow channels of Wensleydale cross Bainbridge High Pasture. In the main valley Bear Park Moraine held up a lake reaching to Bainbridge, and in this lake the River Bain formed a now conspicuous delta.

**VERTEBRATE ZOOLOGY.**—Mr. H. B. Booth, F.Z.S., writes :— Little is known of the mammals, so that any notes will be of value—this especially in connection with any species of Bat, as the Noctule was reported from Carperley very many years ago, and its confirmation would be valuable. The Otter and the Badger should occur, and this is one of the districts where the so-called ' Hill ' or ' Greyhound ' Fox roams. The Water Vole is common, and the Hedgehog, Mole, Common and Water-Shrews, Weasel and Stoat, have all been reported at various times, but confirmative notes will be of value.

For birds, this district is a good one, and the following species (with many others) should be found not uncommonly, viz., Yellow Wagtail, Wheatear, Whinchat, Redstart, Snipe, Common Sandpiper, Redshank, etc. The Dunlin may be met with, and Black Game are more common in suitable places than is generally known. I have repeatedly heard the call

of the Green Woodpecker in the woods close to Aysgarth Falls. At Semerwater a good look-out should be kept for any of the Grebes. In spite of its elevation, it appears an ideal nesting site for the Great Crested Grebe, and also as a nesting station for the Black-headed Gull. Although the latter has nested there, it is by no means regularly used.

Mr. Cheetham informs me that there are a number of stuffed birds in a farmhouse at Carr End that have been shot at various times as rareties visiting Semerwater. These should certainly be inspected.

In fishes, Trout, Grayling and Loaches are common, and in the Yorkshire Naturalists' Union Excursion circular for June 28th, 1884, the late Dr. F. Arnold Lees stated : ' in Semerwater, Bream are numerous and attain a large size.'

Although not a vertebrate, the Fresh-water Crayfish is common in Semerwater and in the adjacent streams.

**BOTANICAL NOTES.**—Many interesting species were mentioned in different publications by the late Dr. F. A. Lees. Many of these should be refound if at all possible, especially *Alisma natans* in the lake, *Equisetum variegatum* and *Crepis hieracioides* (*succisæfolia*) in Baingill, and *Heleocharis acicularis*, south and south-east of Semmerwater. Other interesting plants are *Arenaria verna, Potentilla verna, Saxifraga granulata, Gnaphalium dioicum, Plantago maritima, Polygonum viviparum, Salix phylicifolia, Carex vesicaria, Juncus diffusus, Pyrola minor, Ribes alpinum, Botrychium lunaria,* and *Ranunculus lingua.*

The late W. Ingham reported some interesting mosses which should be sought. Amongst these are *Hypnum vernicosum* and *H. giganteum, Seligeria Doniana* and *S. tristica, Zygodon Stirtoni, Encalypta ciliata* and *Orthothecium intricatum.* The *Trichostomum nitidum* that Ingham cites should be re-examined as a similar gathering from Austwick, passed by the Exchange Club, was afterwards seen to be nearer to the variety *fragilifolium* of *T. tortuosum.* Amongst the hepatics Ingham mentioned *Lophozia turbinata* and *Cephalozia connivens.*

**LICHENS.**—Mr. W. E. L. Wattam writes : The whole area yields an excellent lichen flora. Useful reference may be made to my records for Semerwater, Stallingbusk, Cragdale and Low Blean published in *The Naturalist* for September, 1931, pp. 278-280. Amongst the species then noted were *Collema pulposum* Ach., *Peltigera rufescens* Hoffm., *Candelaria concolor* Wain., *Parmelia mougeotii* Schaer., *P. sulcata* Tayl., *P. conspersa* Ach., *Cetraria glauca* Ach., *Ramalina fraxini* Ach., *R. farinacea* Ach., *Placodium callopismum* Mér., *P. flavescens* A. L. Sm., *P. ferrugineum* Hepp., *Physcia stellaris* Nyl., *P. hispida* Tuckerm. The Orders Lecanoraceæ, Cladoniaceæ, Lecideaceæ and Verrucariaceæ are likewise well represented.

**CONCHOLOGY.**—The late W. D. Roebuck investigated Semerwater, August, 1882, and gives the following :—*Anodonta anatina,* abundant. Other species were : *Limnæa truncatula, Ancylus fluviatilis* v. *gibbosa, Arion ater, A. hortensis, Agriolimax agrestis, Succinea putris, Vitrina pellucida, Hyalinia cellaria, H. alliaria, H. nitidula, H. radiatula, H. crystallina, Helix hortensis, Helicigona arbustorum, Hygromia rufescens, H. hispida, H. granulata, Pyramidula rotundata, P. rupestris, Pupa cylindracea, Vertigo pygmæa, Baltea perversa, Clausilia bidentata, C. cravenensis,* and *Zua lubrica.*

**A Meat Tea** may be had at headquarters at 5-30 p.m., Monday. Members not staying the week-end will please notify Mrs. Thompson.

---

**A General Meeting** will be held at 6-15 p.m. Return trains leave Askrigg at 6-53 p.m. and 8-39 p.m.

# YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, or to The Hon. Treasurer, S. D. Persy Fisher, Sackville Street, Leeds.*

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**Persons related to and resident in the family of a member are admitted as 5/- members, to enable them to attend excursions, but not to receive the publications.**

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## Yorkshire Naturalists' Union.

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.....[*Signature and Titles.*]

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*wishes to become a member of the Yorkshire Naturalists' Union, and will subscribe FIFTEEN SHILLINGS (15/-) per annum until the end of the year in which written resignation is given.*

.....
.....
.....
.....
} [*Signature of Proposer and Seconder.*]

*Elected*.....19 *at*.....

.....*Chairman's Signature.*

CIRCULAR No. 383.

# Yorkshire Naturalists' Union.

**President:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

**Local Secretary:**
RILEY FORTUNE, F.R.P.S., F.Z.S., West Cliffe Terrace, Harrogate.

# The 383rd Meeting

WILL BE HELD AT

# FAIRBURN

to investigate the Flora and Fauna of the INGS

## On Saturday, JUNE 16th, 1934

**Headquarters: "Wagon and Horses Inn," Mr. Dickenson.**

**TRAVEL FACILITIES.**—There is a frequent service of buses from Castleford which is the best railway centre, with trains from most districts arriving about 11 a.m.

**PERMISSION.**—The Airedale Collieries, Ltd., have kindly given permission to visit the Ings and neighbourhood of Fairburn as far as their land is concerned.

**MAPS AND BOOKS.**—Sheet 31 of the 1-inch Ordnance Survey covers the district. Members should read Mr. W. G. Bramley's paper reported in *The Naturalist* of this year on page 9.

**ROUTE.**—Members will meet at the Cross, Fairburn, where the bus stops, at 11-45 a.m., and will then proceed down Cut Lane, along the riverside, and return by the Castleford Road. Others arriving in the afternoon too late to follow this route

will do best to leave the bus at Newton and meet the party somewhere in the vicinity.

**THE DISTRICT.**—W. G. Bramley writes : At the present time this sheet of water, which is only marked on very recent maps, extends to a length of well over a mile and varies in width from a quarter to three-quarters of a mile. The water is not deep, being somewhere in the neighbourhood of three feet with many parts much less.

Even before the advent of coal mining the area was more or less subject to flooding, but this condition soon abated on the lowering of the river, the land being well served with adequate drains. When the colliery just at the opposite side of the river was opened and coal was won from under the Ings, subsistence began to make its influence felt. At first the flood water was longer in getting away and the ground remained longer in a wet condition, eventually the lower lying ground became waterlogged and later formed permanent pools.

With the advent of wetter soil conditions a charge gradually took place in the vegetation. Rushes and reeds began to be established, the species of grasses changed, those used to drier conditions being drowned out, their place being taken by wet-loving forms and species of *Carex*. This change is still going on and a complete series from dry pasture to permanent water can be traced in all its stages.

At the Fairburn end, which was the latest to become permanently under water, there is an island of some acre or two in extent only a few feet above water level and covered with a dense tangle of reeds and coarse grass. The other and larger end is dotted with beds of Bulrush and flag with large areas of *Equisetum* while the remains of dead hedges indicate the old field boundaries of the days when cattle cropped the lush Ings grass.

The water is kept sweet and fresh by the dykes which drain the surrounding country, but chiefly by springs. One such spring has an output of many thousand gallons per day and is used by the two neighbouring villages as their water supply. The outlet is into the river by means of two sluice valves and at the present time the mere only rises when the level of the river is such as automatically closes the valves.

**ENTOMOLOGY.**—Mr. W. D. Hincks writes : It should not be too late for Coleopterists to make a good catch of aquatic beetles. Dipterists may perhaps still find some of the early spring *Syrphidæ* and sallow blossom should be searched for *Melangyna*. The spring *Dolerine* sawflies should be particularly sought for as our British species are not yet completely worked out, these will be obtained by sweeping damp meadows. It is difficult to say what *Odonata* may be expected other than the

ubiquitous *Pyrrhosoma nymphula* and *Enallagma* but though there may be no adults on the wing, the Coleopterists' water net will readily reveal the whole extent of the Dragonfly fauna, especially if the net be of the ' Balfour-Browne ' type suited for heavy work and ensuring the capture of species clinging to the aquatic vegetation. Amongst Mayflies and Stoneflies the stagnant water is sure to have, either as nymphs or adults, *Chlœon dipterum* and *Cœnis* sps. and perhaps a species of *Leuctra*.

**VERTEBRATE ZOOLOGY.**—W. G. Bramley writes: The most numerous bird on the water is the Coot, which breeds freely, but there must be a considerable proportion of non-breeding birds. Waterhens are not so numerous nor so noticeable, preferring the shallower water round the outskirts and the more recently formed small pools in the adjacent marshy land. A few pairs of Snipe and Redshank nest also in the dense herbage at each end of the mere.

Perhaps the most conspicuous bird is the Black Headed Gull which will be seen flying over the surrounding district. Their numbers vary considerably year to year as does their nesting site to some extent.

The Tufted Duck is perhaps the most noticeable of the ducks and many pairs nest annually. The drake is easily noticed but the female is often overlooked, especially as many will be incubating during the time of our visit. Several pairs of Pochard also nest as well as Mallard. An odd pair or two of Teal also nest, but they require careful search and even then are often missed. Scattered about the edges of the water the drake Shoveller should be seen. Last year a dozen drakes were observed, the females being occupied in domestic duties in the thick vegetation.

The chief attraction for the bird lover is the Great Crested Grebe, numbers varying from four or five up to twenty pairs. Nests are often within a few yards of each other, most of them being made in the beds of *Equisetum*.

Many pairs of Lesser Grebe are resident here, but during windy weather when the surface is rippled by waves they are not always easy to detect. Under these conditions they appear to swim deeper in the water.

Round the edges, nesting in the rank herbage, are to be found Sedge Warblers and Reed Buntings. Lesser Redpolls and Reed Warblers also used to nest but last year neither birds were seen during my visits. The latter nested in willow bushes but a good part of these are now buried under the flood bank which may acount for their disappearance. Once or twice Grasshopper Warblers have been heard, but there is no evidence that they have nested.

Sand Martins breed in the banks of the River Aire, and a pair or two of Kingfishers are also generally to be seen.

Swallows, House Martins, and Swifts hawk the air above and find a plentiful supply of food. Sparrows, Pied Wagtails, Turtledove, and other species also use the surrounding vegetation and mud flats as feeding grounds and the Turtledove has occasionally nested in the bushes.

Of the other vertebrates the lake contains Pike, Roach, and Sticklebacks.

Watervoles, or rather their runs and holes, will be noticed in the two outlet drains and mole runs are to be seen in the drier portions of the swamp land.

**BOTANY.**—*Glyceria aquatica* forms dense beds around most of the water with occasional patches of Bulrush and further out there are large areas of *Equisetum*, both the Bur-marigolds, *Bidens cernua*, and *B. tripartita* are to be found.

The Magnesian limestone area bordering the marsh on the north side will repay investigation, especially the old quarries; the grasses *Bromus erectus* and *Brachypodium pinnatum* are typical of this area and other plants frequent on this Permian soil but scarce away from it are : *Ballota nigra, Inula conyza, Astragalus glycyphyllos, Chlora perfoliata,* and *Campanula glomerata.*

**BRYOLOGY.**—Mr. W. H. Burrell writes : The inundated ground between Fairburn and the river, with its rank pasture and sedge, offers little attraction to the moss student ; *Hypnum riparium* is in the ditches ; *Bryum cæspiticium* is now showing antheridia ; *Barbula revoluta, Barb. unguiculata* and *Barb. convoluta* the latter now coming into fruit and showing its large, erect perichætal bracts, occur on wall tops and waste ground ; *Tortula ambigua, Lophozia badensis, Phascum curvicolle,* and *Hypnum chrysophyllum* are generally to be found on old wall tops and limestone exposures. The ' Permian ' has a very interesting moss flora and a suggestion in Circular No. 267 is worth reproducing here : ' the bryologists would do well to visit some of the quarries where lime is burnt and look out for *Tortula cernua* and the rarer Thuidia.'

**GEOLOGY.**—The most evident geological fact is the subsidence of the area that is to be visited, this being due to the extraction of the coal seams from below. Geologists will however, find plenty of interest in the Magnesian quarries at Fairburn and Brotherton where, according to Kendall and Wroot, the percentage of Magnesian carbonate in the limestone falls to almost zero whereas at Micklefield the same rock is a true dolomite with forty-five per cent. Magnesium carbonate.

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**MEETINGS.—A Meat Tea,** price 2/-, will be arranged at headquarters at 5-30 p.m., and will be followed by a General Meeting at 6-15 p.m.

CIRCULAR No. 384.

# Yorkshire Naturalists' Union.

**President:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

**Local Secretary:**
C. W. MASON, 15 Park Avenue, Hull.

# The 384th Meeting

WILL BE HELD AT

# FLAMBOROUGH

## On Saturday, JULY 14th, 1934

Headquarters:
"North Stair Café," North Landing. Mr. Geo. Bayes.

**TRAVEL FACILITIES.—**

| | | | |
|---|---|---|---|
| Train from Leeds, | 7-30 a.m.; | arrive Bridlington | 10-20 a.m. |
| York, | 7-55 a.m.; | ,, ,, | 9-51 a.m. |
| Doncaster, | 6-45 a.m.; | ,, ,, | 9-51 a.m. |
| Hull, | 9-5 a.m.; | ,, ,, | 9-51 a.m. |

Return: Leeds, 6-45 p.m.; York, Doncaster, Hull, 7-21 p.m.

Buses: From and to the North Landing from Bridlington every 15 minutes, allow three-quarter hour. From Bridlington to Speeton for Bempton Cliffs, 10-35 a.m.

**ROUTES.**—All parties meet at Bridlington Station at 10-20 a.m. The Botanists and Entomologists under R. D'O. Good, M.A., F.L.S., and T. Stainforth, B.A., B.Sc., and the Geologists under R. M. Stainforth, will proceed to the shore at Bridlington and make for Sewerby ; at Danes' Dyke the Botanical section will make for the Beacon Hill area, whilst the others proceed along the shore to High Stacks. They should be there at 4-30 p.m., and then make for the North Landing Café. The Vertebrate Section, under C. F. Procter, will take the 'bus from Bridlington to Speeton Cross-road, and proceed along the cliffs to the North Landing.

**BOOKS AND MAPS.**—The area is covered by Sheets 23 and 28 of the large size one-inch Ordnance Map, and reference may be made to Circulars 62, 116, 194, 237 and 322. For lists of shells and seaweeds see 116 (1895), 194 (1906), and 237 (1912). For birds, see Nelson, *Birds of Yorkshire*, and Wade, *Birds of Bempton Cliffs*. For geology, Kendall and Wroot, *Geology of Yorkshire*, Lamplugh, *Drifts of Flamborough Headland* (*Q.J.G.S.*, 1891), Rowe, *Yorkshire Chalk* (*Proc. Geol. Assn.*, 1904), and for plants, Robinson, *East Riding Flora*.

Geologists may be interested by referring to *The Naturalist*, 1930, p. 287, where the question of ' alleged pre-glacial implements at Danes' Dyke ' is discussed, and they can examine the deposit Mr. Bromehead mentions as follows : At Danes' Dyke the deposit was described by Lamplugh as ' loamy stuff resembling a weathered Boulder Clay,' resting on the Sewerby gravels which in turn rest on the Upper Boulder Clay of Flamborough Head.

**VERTEBRATE ZOOLOGY.**—Mr. Chas. F. Procter (Hull) writes :—The chalk cliffs at Bempton and Speeton are among the grandest in England, and in places rise to a height of nearly 400 feet above sea-level, notably at Old Dor. Although from the sea the face of the cliff appears quite smooth and, generally speaking, perpendicular, it is, in reality, fissured and terraced from top to bottom with small ledges representing the edges where the overlying strata have weathered away from their bed for a short distance. These ledges have from time immemorial been the haunts and nesting sites of wild birds, chief of which are the Guillemots, Razor Bills, Puffins, Kittiwakes, and Herring Gulls. There are also Pigeons, Jackdaws, and a few Rock Pipits finding sanctuary in suitable localities. It is with the Guillemots, Razor Bills, and Puffins, however, that the bird life is chiefly identified, although of recent years the Kittiwakes in places have bid fair to assume the upper hand.

For the purpose of gathering the eggs, four gangs of ' climmers,' as they call themselves, operate along the faces of these cliffs. Their methods are too well known to need particularisation here, but at one period of the day one or other of these gangs is operating, and their procedure is a never-ending source of interest.

Mammals are represented by an odd Fox and a fair head of Rabbits. Otherwise the cliff face is devoid of mammal life.

**GEOLOGY.**—J. W. Stather, F.G.S., writes :—To the geologist the name of Flamborough at once suggests the headland of that name, with its long range of lofty chalk cliffs, capped with the glacial drifts. Its shape is roughly triangular, the base of the triangle being a line drawn from Speeton to Bridlington, with the coast forming its two remaining sides. In his classical work, *The Geology of the Yorkshire Coast*, published in 1835, John Phillips describes and illustrates the coast sections, and figures a few of the fossils. In 1895 Mr. G. W. Lamplugh measured and estimated the total thickness of the Flamborough chalk to be approximately 1,200 feet, but said little of its fossils. This omission was made good in 1902, when Dr. A. W. Rowe and Mr. C. Davies Sherborn, both well acquainted with the

richly fossiliferous chalk of the South of England, came to Yorkshire and spent several weeks in the Flamborough area. They were heartily welcomed by the resident geologists, and eagerly scrutinised the local collection of specimens, including the large and unique Mortimer collection at Driffield, and also gladly accepted guidance in their field work. The result of their labours was a lengthy paper in the *Proceedings of Geologists' Association*, Vol. XVIII, Part 4, 1904, containing long classified lists of Yorkshire fossils, and an attempt to show that the well-known fossil zones of the South of England were also recognisable in Yorkshire. They succeeded in doing this more or less successfully, though the sins of commission and omission on the part of some of the Flamborough fossils made their task exceedingly difficult. In reference to this point, Dr. Rowe said, ' The record of the Fauna in this area constitutes a veritable zoological romance,' and again with regard to the distribution of the fossils he alluded to ' strange zonal occurrences and still more strange zonal omissions.' To the casual observer the zonal lines are not easy to trace, but Mr. Sherborn's map and diagrams of the coast sections are clear and helpful. He also constructed a model of Flamborough Head showing its geological structure which is now in the Hull Museum.

Collectors will find the flintless chalk on the South side of the headland best worth visiting, especially the cliff sections and beach between Sewerby and Danes' Dike, where the celebrated sponge beds and Marsupites beds occur. Uintacrinus occurs between Danes' Dyke and South Landing, and although the chalk is harder and fossils more difficult to extract, fairly good collecting can be done between South Landing and High Stacks, the most Eastern point of the headland.

With regard to the Northern side of Flamborough Head, Dr. Rowe remarks : ' We have no counterpart in the South of England of the grand screes of Speeton ; nor are our Southern cliffs, however lofty, comparable to the mighty tide-bound ramparts of Bempton. But the chief glory of the Yorkshire coast lies in its bays. Thornwick, North Sea Landing, and Selwicks display a beauty so rare that they compel the admiration of the most careless.'

**BOTANY.**—Mr. Graham Philip (Hull) writes :—PLANT ASSOCIATIONS OF THE SHORE NEAR FLAMBOROUGH.—The coast between Danes' Dyke and South Landing is suitable for the study of marine ecology of the littoral zone. A well-established Fucus zone, attached to chalk derived from the cliffs, has as yet not been fully investigated. *Pelvetia canaliculata, Fucus vesiculosus, F. serratus,* and *Himanthalia lorea* are known to occur. A Laminaria zone may be seen at low tide. It will be interesting to record other seaweeds and find out if there is any arrangement in their lateral distribution. The Diatomaceæ of this area are especially interesting, as the habitat affords an opportunity of collecting many beautiful marine forms. The following occur as epiphytes on larger algæ :——*Grammatophora marina* (Lyng.) Kutz., *G. serpentina* (Ralfs.) Ehr., *Licmophora paradoxa* (Lyng.) Ag., *L. communis* (Heib) Grun., *Rhabdonema arcuatum* (Ag.) Kutz., *Cocconeis scutellum* Ehr.

Other species are found attached to rocks :—*Rhoicosphenia curvata* var. *marina* (Kutz.) Grun., *Navicula distans* W.Sm., *Schizonema Grevillei* Ag., *Pleuroneis costata* (Greg.) Cl., *Melosira sulcata* (Ehr.) Kutz.

Characteristic of the pools left by the tide are centric diatoms of the marine plankton, such as :—*Coscinodiscus radiatus* Ehr., *Actinoptychus undulatus* Ehr., *Hyalodiscus Stelliger* Bail., *Eupodiscus argus* Ehr., *Biddulphia rhombus* (Ehr.) W.Sm.

As a contrast to the saline environment there are the vertical waterfalls and damp places on the chalk cliffs. Here is to be found a typical association

of freshwater Algæ obtaining a foothold by mucus attachment. Among the diatoms occurring is the stipitate *Gomphonema olivaceum* Kutz., and both *Cymbella microcephala* Grun. and *C. Cistula* var. *maculata* Hempr. attached by mucus pedicels. These forms are visible as prominent yellow-brown films on the white chalk. In places other strata of the blue-green Myxophyceæ (*Oscillatoria* and *Lyngbya* sp.) occur ; and the filamentous Chlorophyceæ are represented by some obscure attached species. This habitat will well repay attention, as it is unknown what forms occur at lower levels where the sea washes the cliffs at high tides.

Mr. T. Stainforth (Hull) writes :—On five previous occasions the Union has visited the Flamborough area, the dates of the visits ranging between May 25th and July 11th. As a result the botanical features of the headland are fairly well understood. The district, too, has been a favourite one with local natural history societies and, moreover, has been thoroughly investigated by such able botanists as Mr. R. J. Flintoff and the late J. F. Robinson. The latter's account of the 1912 excursion, and Dr. T. W. Woodhead's paper on the ' Plant Associations of Flamborough Head,' appearing in *The Naturalist* for July of that year, give a thorough account of the plant life, and should be referred to.

A small area that seems promising to me is that formed by the rough sandy and clayey slopes below Beacon Hill. Here, on the wetter patches, are interesting ' thickets ' of *Equisetum maximum* with other mud-loving plants. Last year I noticed on the sandy parts, Henbane in fruit, the Great Mullein, Viper's Buglos, Pyramidal and other orchids in fruit, and abundance of the Carline Thistle. The Beacon Hill area might be the subject of a little ecological study. The ledges of the chalk cliff also form an interesting habitat, requiring, however, for its investigation apparatus not usually included in the botanist's vasculum. One may note on the ledges such plants as Thrift, Greater Knapweed, Yellowwort, *Cerastium tetrandrum*, Scurvy Grass, Dyer's weed, Bladder Campion, the fleshy variety of the Kidney Vetch and variety *maritima* of the Scentless Mayweed.

**ENTOMOLOGY.**—Coleoptera : Mr. T. Stainforth writes :—The coleopterist will find the decaying seaweed at the foot of the Sewerby cliffs rich in species. Here in the clay cliffs formerly occurred in some numbers *Nebria livida* and *Chlænius vestitus*, but the grading of the cliff has probably eradicated them. The Beacon Hill locality referred to in the botanical notes should be well worth close investigation. Here some years ago I took a specimen of *Licinus depressus*, a species only previously recorded for Yorkshire more than a century ago. Earlier in the year the Oil Beetle (*Meloe proscarabæus*) occurs here. On the wetter parts of the Beacon Hill slopes *Chlænius vestitus* should occur, and its discovery here would be interesting. For complete lists of species recorded reference should be made to reports of previous Flamborough excursions.

Lepidoptera : The area is apparently not rich in this order, but the following have occurred :—*Argynnis aglaia, Satyrus megaera, Macroglossa stellatarum, Sesia ichneumoniformis, Zygæna loniceræ, Z. filipendulæ, Gnophos obscurata, Acidalia scutulata, Strenia clathrata, Abraxas ulmata, Emmelesia aechemillata, Eupithecia centaureata, E. subfulvata, Eubolia bipunctaria, Leucania conigera, L. impura, Cerigo cytherea, Miana literosa, M. arcuosa, Agrotis tritici, Noctua C-nigrum, Dianthaecia capsincola, Dasypolia templi, Aplecta nebulosa, Abrostola urticae, Plusia chrysitis, P. V-aureum.*

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**MEETINGS.**—Tea will be served at headquarters, North Stair Café, at 5 p.m. Plain tea, 1/3 ; meat or crab tea, 2/-.

**A General Meeting** will follow at 5-45 p.m.

CIRCULAR No. 385.

# Yorkshire Naturalists' Union.

**President:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

**Local Secretary:**
Dr. JOHN GRAINGER, B.Sc., Tolson Museum, Huddersfield.

# The 385th Meeting

WILL BE HELD AT

# GOOLE

## On Saturday, AUGUST 4th, and Monday, AUGUST, 6th, 1934

**for the investigation of Rawcliffe Rabbit Hills and the country round Ousefleet and Trent falls.**

**TRAVEL FACILITIES.**—Goole is well served by rail and by road. The trains are :—

| | | | | |
|---|---|---|---|---|
| Leeds *via* Knottingley ... | 8-58 a.m. | Goole ... | 10-15 a.m. |
| returning ... | 5-55 p.m. | Leeds ... | 7-26 p.m. |
| Hull ... ... ... | 9-15 a.m. | Goole ... | 9-53 a.m. |
| returning ... | 7-3 p.m. | Hull ... | 7-34 p.m. |
| Sheffield ... ... ... | 8-15 a.m. | Goole ... | 9-27 a.m. |
| returning ... | 7-6 p.m. | Sheffield ... | 8-22 p.m. |
| York *via* Barlow ... | 7-41 a.m. | Goole ... | 8-55 a.m. |
| returning ... | 6-18 p.m. | York ... | 7-30 p.m. |

Buses :—

| | | | | | |
|---|---|---|---|---|---|
| | a.m. | | a.m. | | a.m. |
| Leeds ... | 8-47 | Selby ... | 9-55 | Goole ... | 10-42 |
| or Leeds ... | 8-7 | Castleford ... | 8-43 | Goole ... | 10-13 |
| Hull ... ... | 7-52 | Goole ... | 9-45 | | |
| Doncaster ... | 7-45 | Goole ... | 9-2 | | |

**BOOKS AND MAPS.**—The area is covered by Sheet 32, large size 1-in. Ordnance Map. In the early days of the Union, when Dr. H. F. Parsons was Secretary of the Goole Scientific Society, meetings were held at Goole and Snaith and interesting circulars and reports are available, see *The Naturalist*, 1877, 1881, 1882. Meetings were held later with Goole as headquarters for Lincolnshire localities. Since these early days the district has been neglected and it is hoped that all sections of the Union will carefully note the species now to be found in the present flora and fauna of the district.

**HEADQUARTERS.**—Lyceum Temperance Hotel, Messrs. Newell and Tasker, Boothferry Road, 10/- per day. Accommodation is limited but the Station Hotel, Mrs. A. W. Stafford, is quite near and here bed and breakfast can be had at 7/6 per night.

**ROUTES.**—On Saturday, members who have arrived by train will take the bus to Rawcliffe at 10-45 a.m. and meet on the Green at 11 a.m. Those who are coming to Goole by bus may stop at Rawcliffe on the way. The ponds in the sandy area known as Rawcliffe Rabbit Hills will then be visited.

On Monday, the party will take the bus to Ousefleet and examine the Humber shore to the Trent mouth and, if time permits, return by the Adlingfleet drain back inland to Ousefleet, returning by the 5-30 p.m. bus to Headquarters.

**GEOLOGY** (Goole District).—Professor A. Gilligan, D.Sc., F.G.S., writes :—No solid rocks come to the surface anywhere in the district, the nearest exposure of the Triassic Rocks which floor the Vale of York being at Snaith, about seven miles to the West of Goole. The succession of superficial deposits is as follows : Warp, Peat, Laminated Clay, Gravel, Boulder Clay (in some places). Much of the surface of the district actually lies below the high water mark of spring tides and the River Ouse is embanked to the necessary height to prevent flooding of the land. Before the embanking the muddy water of the river overflowed the area and deposited the sediment to form the warp land which now forms the surface of the aria.

' Warping ' of the land by artificial means is a well-known practice in the district. From the examination of the material forming the warp it has been inferred that it represents the disintegrated products of boulder clay and has probably been derived in large part from the crumbling cliffs of the Holderness coast.

Below the warp is the Peat or Forest Bed over Thorne Moor to the south of Goole. This peat is twenty feet thick but at Goole it is only about six inches.

The late Dr. Parsons, of Goole, recorded (1877) that at the base of the peat are the stumps of innumerable trees many of large size, the majority of them being Scotch fir ; but Oak, Willow, Birch, Hazel, and other trees are also present. Many of them carried evidence in the form of tool marks that they had been cut down by early inhabitants of the district. Stumps of trees were seen by Dr. Parsons in the river bed at Goole between tide marks.

The laminated clay and gravel are deposits of glacial origin associated with Lake Humber, which was formed by the closing of the mouth of the Humber by North Sea ice. The gravels consist of detached mounds which frequently have the larger axes approximately east and west. The pebbles are almost exclusively of Carboniferous Sandstones and Grits, with an admixture of sand derived from the Bunter Beds of the Trias in the Vale of

York. The gravels are strongly current bedded usually to the south east. To the west and north of Goole these gravels are being extensively worked for the making of concrete.

Boulder Clay is sometimes found beneath the gravels, but more frequently they rest on rocks of Triassic Age. The indications from borings for coal (Reedness, 1835) and water are that the boundary between the Keuper Beds to the east and the Bunter Beds to the west runs almost north and south through the township of Goole. This is a very important point in all considerations of obtaining water from these beds by means of boreholes, since the Keuper Beds contain clay bands with gypsum while the Bunter Beds are practically free from such bands.

**BOTANY.**—Dr. W. A. Sledge, B.Sc., writes :—The Botany of the Goole area was intensively worked sixty years ago by Dr. H. F. Parsons, who recorded many uncommon species. As no recent records have come in from this area the botanists should endeavour to confirm as many of these records as possible. From Rawcliffe Common and ' Rabbit Hills ' are recorded : *Papaver argemone, Cerastium arvense, Hypericum elodes, Radiola millegrana, Trifolium filiforme, Apium inundatum, Gentiana Pneumonanthe, Limosella aquatica, Scirpus fluitans, Pilularia globulifera.* Most of the aquatic and marsh species have probably now disappeared, but some ponds still exist and these should be carefully examined. From Goole Moor *Drosera anglica, D. intermedia, Myrica Gale,* and *Rynchospora alba* are recorded, and by the Ouse below Goole many maritime species occur, including *Cochlearia officinalis, Spergularia salina, Trifolium fragiferum, Apium graveolens, Œnanthe Lachenalii, Aster Tripolium, Glaux maritima, Samolus valerandi, Armeria maritima, Plantago maritima, P. coronopus, Atriplex littoralis, Rumex maritimus, Zannichellia pedicellata, Triglochin maritimum, Juncus Gerardi, Scirpus Tabernæmontani, S. maritimus, Carex distans, C. divisa, Glyceria maritima, G. distans,* and *Lepturus filiformis.* Other species recorded for the area are *Ranunculus hirsutus, Erysimum cheiranthoides, Nasturtium amphibium, Peplis Portula, Oenanthe fistulosa, Pimpinella major, Dipsacus sylvestris, Anthemis cotula, Bidens cernua, B. tripartita, Helmintha echioides, Cuscuta Trifolii, Galeopsis Ladanum, Lysimachia Nummularia, Rumex Hydrolapathum, Euphorbia platyphylla, Typha latifolia, T. angustifolia, Acorus Calamus, Sagittaria sagittæfolia, Alluim vineale, Tolypella glomerata, T. intricata.*

**LICHENS.**—W. E. L. Wattam writes :—I can find no trace of any records. Investigation for these plants should prove satisfactory. Records are desirable and I should be pleased to determine any species which may be collected. Doubtless the area will produce *Parmelia perlata* Ach., *P. saxatilis* Ach., *P. sulcata* Tayl., *Evernia prunastri* Ach., *Candelariella vitellina* Müll.-Arg., *Lecanora muralis* Schaer., *L. galactina* Ach., *L. parella* Ach., *Lecidia confluens* Ach., *L. immersa* Ach., *L. rivulosa* Ach., *Pertusaria pertusa* Dalla, T. and S., and several Cladonias.

Pond Life.—In the reports of the earlier meetings *Hydra fusca* was collected at Rawcliffe and also *Volvox globator, Pandorina morum,* and *Gonium pectorale* from the ponds on the Rabbit Hills.

**ENTOMOLOGY.**—Little seems to be known about the area to be visited but whilst at Ousefleet after the Fairburn meeting our Secretary saw several specimens of the large Dragon Fly, *Libellula depressa* L., a species which is little known from Yorkshire localities.

**COLEOPTERA.**—Mr. T. Stainforth, B.A., B.Sc., Hull, writes :—The banks of the Ouse in the neighbourhood of Goole swarm with individuals of species of *Bembidion, Trechus, Asaphidion, Anchomenus, Amara,* and

*Stenus*. Possibly the commonest and most characteristic Bembidion is the rather handsome *lunatum*. Occurring with it are *flammulatum, littorale, biguttatum*, and others. *Asaphidion* (*Tachypus*) *flavipes* is an invariable associate of these. The numerous willows on the Ouse banks should be productive of salicicolous Coleoptera and other group of insects.

**VERTEBRATE ZOOLOGY.**—Writing after a recent visit, Mr. C. W. Mason says he found the shore round Ousefleet and Trent Falls the most interesting, and here he saw Shelducks, Wild Ducks, and many species of Gulls whilst last year near Rawcliffe he saw the young Otters which caused a deal of talk owing to the misleading newspaper reports. The Great-Crested Grebe is to be seen at Drax, the Black-headed Bunting is plentiful along the drains and at earlier meetings the Stonechat, Whinchat, Tree Sparrow, Wheatear, Sedge, and Reed Warblers were noted in the reports.

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**MEETINGS.—Tea** will be served at Headquarters, Lyceum Temperance Hotel, on Monday, at 5-45 p.m., price 1/9.

**A General Meeting** will follow at 6-15 p.m.

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# YORKSHIRE NATURALISTS' UNION.

For particulars apply to

*The Hon. Secretary, 29 Frankland Terrace, Leeds; or to the Hon. Treasurer, S. D. Persy Fisher, Sackville Street, Leeds.*

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CIRCULAR No. 386.

# Yorkshire Naturalists' Union.

**President:**
F. A. MASON, F.R.M.S., 29 Frankland Terrace, Leeds.

**Hon. Secretary:**
CHRIS. A. CHEETHAM, F.R.E.S., Austwick, *via* Lancaster.

**Hon. Treasurer:**
S. D. PERSY FISHER, Sackville Street, Leeds.

## The 386th Meeting

WILL BE

## THE ANNUAL FUNGUS FORAY
OF THE
## MYCOLOGICAL COMMITTEE
AT

# INGLETON

for the investigation of the woods in the Glens and also at Austwick (Oxenber) and Keasden.

## From Saturday, September 15th to Thursday, September, 20th, 1934

*Chairman of the Mycological Committee*:
Mr. T. PETCH, B.A., B.Sc., King's Lynn.

*Hon. Secretary and Convener*:
Dr. J. GRAINGER, Tolson Memorial Museum, Huddersfield.

*Recorder*: Mr. F. A. MASON, Leeds.

**HEADQUARTERS.**—Ingleborough Hotel. Terms 10/- per day for bed, breakfast, sandwiches, and dinner. Applications

for rooms, stating requirements, and date of arrival, should be sent to the Proprietor, Mr. A. Camm, Ingleton.

**PERMISSION** to visit parts of the district has been given by Mr. S. Farrah.

**EXCURSIONS.**—On **Saturday**, the east side of the Beezley Glen will be visited. **Sunday**, Thornton Glen as far as Pecca Falls. **Monday**, the west side of the Beezley Glen. **Tuesday**, will be devoted to the scrub-woods on Oxenber at Austwick, and **Wednesday** to the Clapham Hall Woods on the Keasden Beck. If possible Austwick Moss will be examined on **Thursday.**

**GUIDES.**—Mr. C. A. Cheetham will act as guide for the excursions.

**MEETING.**—The Annual Meeting of the Committee will be held at Headquarters, on Saturday evening, September 15th, at 8 p.m.

**LECTURES.**—The Chairman's Address will be on 'The Hypocreaceæ,' and will follow the Annual Meeting of the Committee.

Mr. Petch will also speak on 'Mycology in the Tropics.'

**EXHIBITION.**—Mr. F. A. Mason's photographs of Fungi, will be on exhibition throughout the meeting.

**SPECIAL WORK.**—Members are requested to bring books and microscopes, and attention is drawn to the opportunity of extending our knowledge of the larger Ascomycetes. Mr. T. Petch has made a special study of a section of the Ascomycetes, the Hypocreaceæ, further to his address of last year, and will outline his results at the meeting.

Members who desire to raise any mycological subject for discussion or who would care to deliver short notes to the meeting, are invited to communicate with the Hon. Secretary of the Committee.

CIRCULAR No. 387.

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## Hon. Treasurer:

S. D. PERSY FISHER, Sackville Street, Leeds.

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J. MEIKLE BROWN, B.Sc., F.L.S., F.R.E.S.

# The 387th Meeting

## and 73rd Annual Meeting

WILL BE HELD AT

# BRADFORD

## on Saturday, December 8th, 1934

The Annual Meeting of the Union will be held in the Technical College, Bradford, on the joint invitation of the Bradford Natural History and Microscopical Society and the Bradford Scientific Society.

**TRAVEL FACILITIES.**—Details relating to the departure of trains from Bradford after the meeting.

E.=Exchange Station. F.S.=Forster Square Station.

For :—

Barnsley. (E.) 8-25, 9-25.
Darlington. (F.S.) 9-58.
Halifax. (E.) 8-20, 8-57, 10-0, 10-15, 10-50, 10-57.
Huddersfield. (E.) 9-17, 9-25, 10-0, 10-20, 10-57.
Hull. (E.) 9-25, (F.S.) 9-7.
Leeds (E.) Via Stanningley, 8-15, 8-45, 9-5, 9-25, 9-45, 10-50, 11-5.
(F.S.) Via Shipley, 8-8, 9-7, 9-58, 10-50.
Manchester (Victoria). (E.) 8-20, 8-57.
Sheffield. (E.) 9-17. (F.S.) 9-7, 9-58, 10-50.
Skipton. (F.S.) 8-1, 9-2, 10-2, 11-2, 11-32.
Wakefield. (E.) 9-25, 10-5, 10-40.
York. (E.) 8-15, 8-25, 9-45. (F.S.) 8-8, 9-58.

Will members please check the times of their own trains.

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# PROGRAMME.

2-0 p.m. **Sectional and Committee Meeting.**

2-30 p.m. **Executive Meeting.**

3-15 p.m. **General Committee Meetings.**

5-0 p.m. **Tea** (Rooms Nos. 74, 75.) 1/8 per head, with meat or fruit, 1/- for plain tea.

6-15 p.m. **Reception** in the College Hall by the Lord Mayor of Bradford, Councillor Walter Hodgson, J.P.

6-30 p.m. **Annual Meeting** in the College Hall, after which the Lord Mayor will take the Chair and the President of the Union, Mr. F. A. Mason, F.R.M.S., will deliver his PRESIDENTIAL ADDRESS, "Some By-paths of Mycological Study," which will be illustrated by lantern slides.

8-0 p.m. **Conversazione** on the invitation of the Bradford Scientific and the Bradford Natural History and Microscopical Societies.
There will be an exhibition of various phases of the work of the two Societies, and of others interested in Natural History.

The Biological Department of the College will arrange an exhibit of "Biological Studies" under the supervision of Mr. A. Malins Smith and Dr. Ritchie.

During the evening refreshments will be provided through the kindness of the inviting Societies.

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